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Mirka DEROS

POPULAR WOODWORKING MAGAZINE

April 2015 ■ #217

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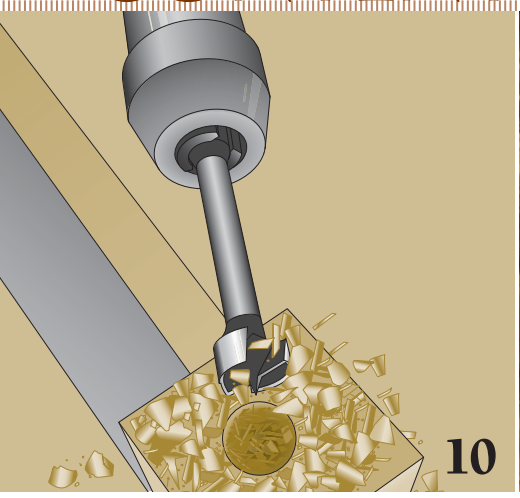
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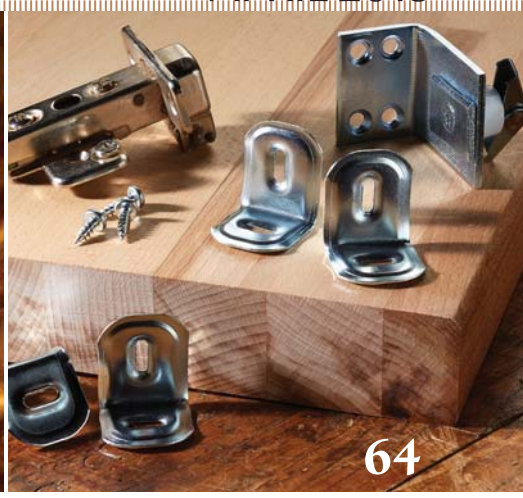
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POPULAR WOODWORKING MAGAZINE

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Enter the 2015 PWM Excellence Awards

The submission period commences on April 1 for the 2015 PWM Excellence Awards; entries will be accepted through June 14 at popularwoodworking.com/2015readerexcellence.

This will be the third year we've sponsored the awards. What I've liked most about them is seeing and sharing the great work produced by *Popular Woodworking* readers. And I want to see more of it! I encourage all of you to submit your best work for the 2015 awards. The six winners will be featured in the November 2015 issue, and all entries are available for viewing online for Readers' Choice voting.

The Grand-prize Winner will receive a check for $1,000. Each of the five Editors' Choice winners and the Readers' Choice entry with the highest number of votes overall win a $100 gift certificate to ShopWoodworking.com.

You can enter up to five pieces total in the five following categories:

- Casework, Cabinets & Bookcases
- Seating
- Tables
- Boxes & Smalls (a "small" might be, for example, a beautiful shop-made tool or wooden toy)
- Turnings, Carvings & Objets d'Art ("objets" encompass wall-hung art pieces, sculpture, wooden jewelry, etc.).

Note that you can submit already completed work for consideration; we're not expecting you to build a Roentgen-style cabinet in the next three months (but if you can actually pull that off, well, do get in touch with me about writing an article).

The editors and contributing editors to *Popular Woodworking Magazine* will select the Grand-prize Winner, plus the winner in each of the five categories. Your online voting determines the Readers' Choice winner (voting opens June 17).

Gary Staple, of Halifax County, Nova Scotia, was the grand-prize winner in 2014 (his "Cherry Blossom Tea Case" is pictured here). I hope to meet him in person Sept. 25, at Woodworking in America 2015 in Kansas City, Mo.

Autumn Doucet, of Wenatchee, Wash., was our inaugural winner in 2013 for her "Figured Cherry Chest"; she not only won a trip to join us at Woodworking in America 2014, we featured her lovely mahogany and ebony jewelry box with mother-of-pearl and abalone inlay in the April 2014 issue (#210).

Plus, the PWM Excellence Awards have led to articles by other entrants, including Peter Marcucci (who shared "Recreating Rohlfs" in the February 2015 issue, #216), and some yet to come.

So…our next big winner and featured woodworking author just might be you!

You'll find all the contest details, as well as directions on how to enter, on our web site at popularwoodworking.com/2015readerexcellence. **PWM**

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The Ins & Outs of Workbench Joints

I've finally started on a workbench from the "Build a Sturdy Workbench in Two Days" DVD, but I have a question about the stretchers. Is there a particular reason why the stretcher joints are on the inside rather than the outside?

Naveen Gogineni
Damascus, Maryland

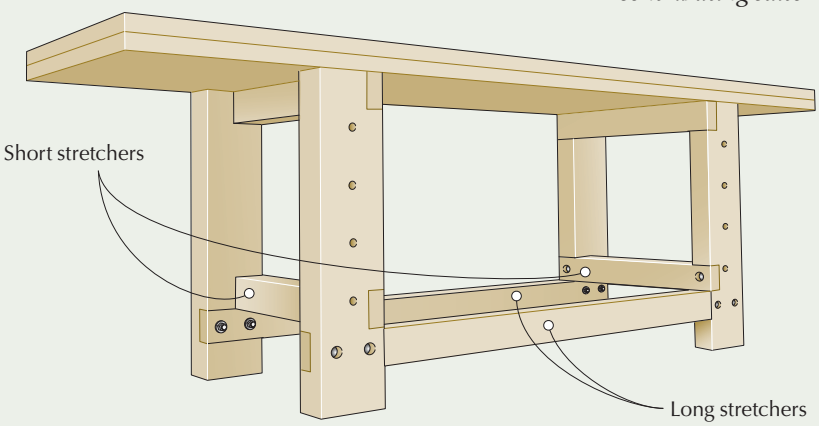
Naveen,
The reason the joinery is on the interior of the legs is visual.

For the long stretcher, it makes the bench look more like a traditional bench with a mortise-and-tenon base. It also helps to hide any gaps in the joinery.

For the short stretchers, it insets the short stretcher and adds shadow lines.

Feel free to put the joinery on the outside if you prefer.

Christopher Schwarz, contributing editor



Keep it in the Pink

I enjoyed Bob Flexner's article on teak oil in the February 2015 issue (#216), especially the UV-resistance portion.

I recently procured a large cherry tree that had fallen in a farmer's field. I had it cut into boards and dried them, and I am in the process of learning how to make furniture.

I have not found a way to keep the finished products from darkening. I don't particularly mind the darkening result, but my wife does.

More importantly, if something is placed on the surface (flower pot, etc.) it shields the wood below it from sunlight and leaves a surface that is not uniform. I have finished the pieces so far with shellac, followed by multiple coats of water-based polyurethane.

Do you have any suggestions or references that might be useful?

Dean Birzele
Elkhart, Indiana

Dean,
Funny – most woodworkers want to know how to make cherry darken to the rich rust-red color of old cherry faster than just letting it age naturally. (There's no good way to do this.)

You're the only person I've come across who wants to keep the cherry its natural pinkish color. Unfortunately, there's no good way to do this, either.

The cause of the darkening is exposure to oxygen and light, which speeds the oxidation. You can reduce exposure to light, but not oxygen.

So no matter what you do, the cherry is going to darken.

You can apply a number of coats of UV-resistant marine varnish from a marina store (or online) to slow the darkening. As I showed in the teak-oil article, varnishes from home centers aren't effective, no matter what their claims.

But I don't think you're going to like this solution. Marine varnishes are glossy to reflect as much of the light as possible, and they are more effective with more coats. You're going to end up with a thick, glossy finish that will not stop the wood from darkening slowly anyway. I suggest you experiment on scrap wood.

Neither shellac nor water-based polyurethane offer significant UV resistance.

As for the flower pot, I suggest you move it to different locations every now and then.

Bob Flexner, contributing editor

Erasing Makers' Marks

I recently read your article "Make Your Mark" (December 2014, issue #215) and took away a few things I will incorporate into my routine. I did, however, have a question: When do you remove the marks?

If the marks make it less likely to make a mistake during final assembly, do you wait until after glue-up and handplane or scrape them off? Or do you remove them just prior to assembly and just keep them in order?

Glen Farmer III
via e-mail

Glen,
I remove marks after assembly. You generally have to plane every surface after assembly anyway to level joints.

Before planing I remove most of the pencil marks with alcohol. That makes it easier to plane away the marks.

Christopher Schwarz, contributing editor

CONTINUED ON PAGE 8

ILLUSTRATION BY MARY JANE FAVORITE

CONTINUED FROM PAGE 6

Must One Always Sand?

In "The Essential Woodworker" (Lost Art Press), Robert Wearing recommends planing and scraping, then sanding.

I have a DVD from Frank Klausz in which he works on a cherry coffee table by planing and scraping, then pulls out his Festool Rotex sander and sands the whole top. Frank says it is to prepare the surface for finish.

I've made just four "real" projects in cherry and ash and, with wipe-on film finishes, sanded only between coats. I avoid sandpaper, mostly because of the mess in my garage – it gets everywhere.

I doubt there's a simple answer to this – but is it species-related, finish-related or just a preference as to whether you sand before applying finish?

Nathan Harold
Pleasanton, California

Nate,

Historical practice goes something like this: Plane until you can't get the surface any nicer. Scrape any tear-out. Use an abrasive to blend the textures of the two kinds of surfaces and remove any remaining tool marks.

Sometimes you don't need to scrape or sand because the wood is so well-behaved. Sometimes the type of finish you are using (such as French polish) demands a dead-flat surface that requires sanding.

So it really just depends. Here are some additional thoughts.

1. Abrasives were around before planes (sandstone), so don't pooh-pooh their effectiveness.

2. Sometimes sanding is needed, especially when you are using modern dye stains. A sanded surface makes the dyes penetrate more evenly in my experience.

3. After you put a film finish on a piece of wood, it's impossible for most people to tell if the wood was sanded or planed.

4. Planing is faster but requires more skill. Sanding is slower, but it is easy to learn the basics.

So the bottom line for me is this: Plane if you can, sand if you must.

Christopher Schwarz,
contributing editor

Avoiding Amber Waves

I used Zinsser Amber Shellac for an early banjo I made. While it turned out pretty good, I had a lot of trouble. I used the shellac straight out of the can, and it ran and streaked a lot. I am almost finished with a parlor guitar, and I am thinking of using the same shellac. This time, however, I will thin it so as to hopefully avoid most of that.

Should I thin the amber-tone stuff to a one-pound cut? If so, does that mean fill a jar two-thirds full of denatured alcohol and fill the remaining one-third from the shellac can? Should I make a thicker mix for later coats? Also, what type of brushes do you use?

Jason Stamper
Mountain City, Tennessee

Jason,

I think Zinsser comes out of the can at a three-pound cut; one pound is pretty thin, but I wouldn't make it any thicker for later coats – just add more coats. I'd experiment first with a two-pound (or so) cut (about two-thirds shellac and one-third alcohol).

These days I use a spray system for shellac and almost every finish (except paint) – it's much closer to foolproof than ragging or brushing.

If I did have to brush shellac, I'd use a natural (ox) bristle.

But for such a lovely and involved item as a guitar, I'd take the time to do a proper French polish. It's not difficult; it just takes a little time and stick-to-itiveness. **PWM**

Megan Fitzpatrick, editor

ONLINE EXTRAS

Letters & Comments

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PHOTO BY THE AUTHOR

Highly Recommended

Dental floss (an unwaxed tape variety that doesn't leave filaments behind but isn't overly slick) is a cheap and easy-to-find item that belongs in your toolbox.

I use it most often for pulling glue into cracks (say, if I bang together too-tight dovetails and cause a minor split). Pull out a length, coat a bit of it with glue, then work it into the split. Remove the floss and clamp. Floss also comes in handy for cleaning junk out of small drill bits and the lead screws on auger bits.

— Megan Fitzpatrick

POPULAR WOODWORKING MAGAZINE

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Safety is your responsibility. Manufacturers place safety devices on their equipment for a reason. In many photos you see in *Popular Woodworking Magazine*, these have been removed to provide clarity. In some cases we'll use an awkward body position so you can better see what's being demonstrated. Don't copy us. Think about each procedure you're going to perform beforehand.

THE WINNER:

Forstner Bit in a Hand Brace? Sure!

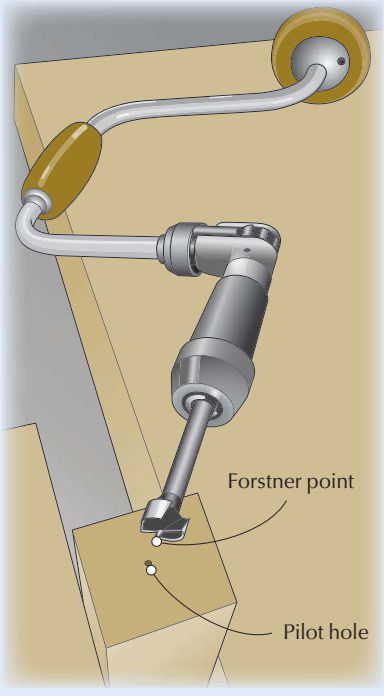
Trying to bore with a Forstner bit using a hand brace is a nearly impossible task. I've come up with a solution that works fast and effortlessly.

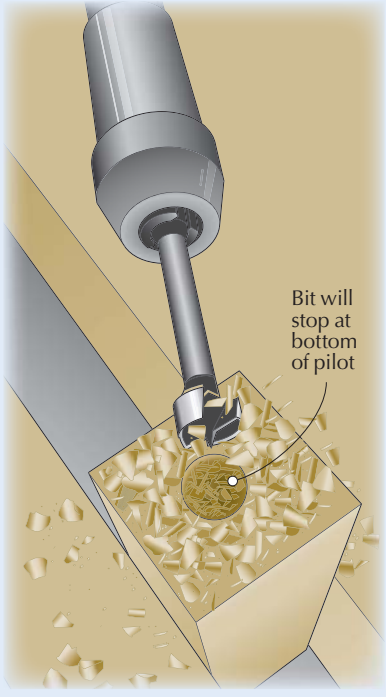
Drill a pilot hole to whatever depth you desire, then place the point of the Forstner bit into the hole. The cutting edges of the bit itself will then come into contact with the timber, and you can start boring; within a short amount of time, you'll have successfully bored a hole.

The real beauty is that the pilot hole acts as a depth stop. Once the bit bottoms out to the depth of your pilot hole, it will not bite into the timber; it will just spin in place and stop cutting.

So not only can you bore faster, you can bore to depth without fear of going beyond your "depth stop" pilot hole.

Salko Safic
Pacific Pines,
Gold Coast, Australia





Precise Plane-blade Setting

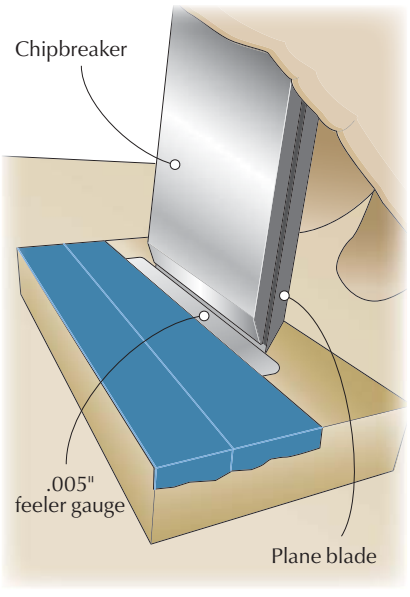
One way to attack problems with tear-out when handplaning is to set the chip-breaker tight to the edge of the plane blade. Here's a foolproof way to get a precise and repeatable blade setting every time.

Select a feeler gauge with a thickness equal to the distance you want to set the breaker back from the cutting edge – say .005". Tape the feeler gauge to a hard, flat surface.

Touch the back of the iron to the flat surface and against the edge of the feeler gauge. Slide the breaker down the back of the iron until it touches the feeler gauge. (If the iron has a curved cutting edge, apply downward pressure in the center of the iron and the breaker.)

Tighten the cap screw, and you're done.

Rhett Fulkerson
Frankfort, Kentucky



Show, Don't Tell

I worked with a couple a while back who were trying to meet two competing concerns for a custom dining set: They wanted a table large enough for six people, but they wanted it as small as possible.

After they decided on an overall table shape and chairs, I sent them home with six chairs and a cardboard cutout of the smallest six-person table I could recommend (40" x 72"). They wanted a 60"-long table.

I had them invite four of their largest friends to dinner, then serve them with that template laid atop their existing table and the chairs gathered 'round.

After dinner, they decided a 68"-long table was as small as they could go.

Mark Hicks
Ozark, Missouri

ILLUSTRATIONS BY MARY JANE FAVORITE

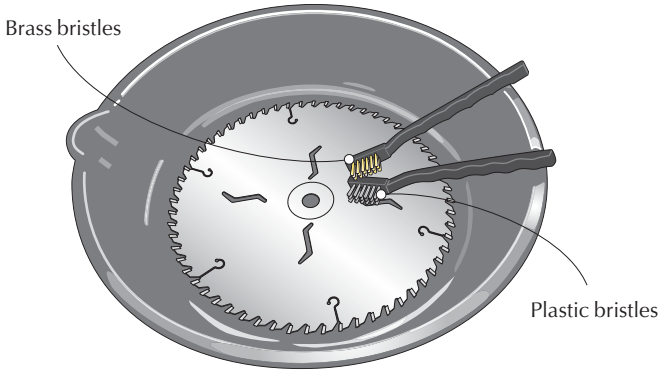
Dodge Marital Discord With an Oil Drain Pan

I've been using my wife's metal pie pans for cleaning table saw and miter saw blades. Besides the fact that the blade's teeth scratch up the inside of the pan, she just doesn't like the idea of baking pies in a pan that was used to clean cruddy saw blades. I've been banned from the pan!

I never liked the idea of possibly dulling the teeth by banging them around in a metal pan anyway, so I started to think about a substitute. A shallow plastic pan, with a diameter large enough to accommodate 10"-12" saw blades, would be great. After some thought, I came up with a plastic oil-drain pan from an auto-supply store. And I found such a pan at the local dollar store for…$1.

Just place the saw blade in the pan, squirt in some liquid dish soap and add enough warm water to cover the blade. Let it soak for a few minutes, then scrub the blade and teeth with a plastic- or brass-bristled brush. The drain pan does the job, and the soft polyethylene surface won't take the edge off the teeth.

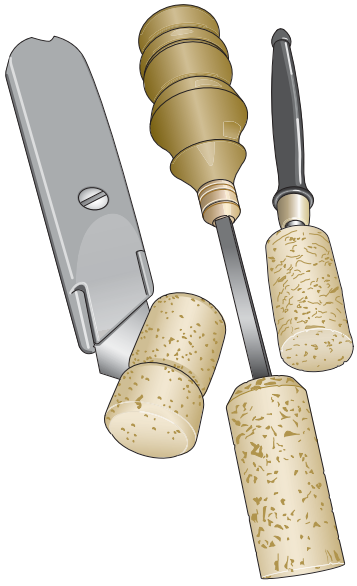
John Cusimano
Lansdale, Pennsylvania



A Corker of a Blade Guard

One of my students showed up with all of his knives and awls protected by corks from wine or beer bottles. It seems silly, but cork is the best reusable guard I've found. It doesn't slip off, like plastic protectors. And it makes your sharp tools easy to find in a tool chest.

Christopher Schwarz
Fort Mitchell, Kentucky



Automotive Starting Fluid Makes a Mean Brush Cleaner

To clean polyurethane finishes or oil-based paints from small paintbrushes, such as a hobby or artist's brush with natural bristles, the typical approach is to dispense a tiny amount of mineral spirits or other solvent into a small container, then soak the brush. But there's an easier and more convenient way: Use a spray can of "starting fluid" from an auto-parts store.

Spray the fluid directly on the bristles. As with all flammable solvents, always use in a well-ventilated area and away from open flames. Also, be careful about where you direct the overspray (starter fluid is a solvent after all – it likely contains heptane – and thus can damage some finishes). Then wipe the brush dry with a paper towel.

Repeat this process two or three times or as needed.

The final step is the same as with any solvent: Wash the bristles with soap and water, rinse well and let dry. **PWM**

David Long
Lexington, Kentucky

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Each issue we publish woodworking tips from our readers. Next issue's winner receives a $250 gift certificate from Lee Valley Tools, good for any item in the catalog or on the web site (leevalley.com). (The tools pictured below are for illustration only and are not part of the prize.)

Runners-up each receive a check for $50 to $100. When submitting a trick, include your mailing address and phone number. All accepted entries become the property of *Popular Woodworking Magazine*. Send your trick by e-mail to popwoodtricks@fwmedia.com, or mail it to Tricks of the Trade, *Popular Woodworking Magazine*, 8469 Blue Ash Road, Suite 100, Cincinnati, OH 45236.

DEROS Random-orbit Sander

Mirka's compact electric sander performs like an air-powered tool.

I avoid sanding as much as possible – but sometimes it has to be done. Since early 2010, when we got a Mirka CEROS (Compact Electrical Random Orbital Sander) in for pre-release testing, that's been my go-to tool for this dreaded task.

What I've never liked about the CEROS, however, is that it plugs into an external power pack that then plugs into the wall. Yes, the sander outperforms other electric sanders (it looks, feels and performs like an air-powered unit), but coupled with the power pack for which you have to allow room, it's far more cumbersome to move around, there are several connections to check, and it takes more space to store. And it's a bit inconvenient to pack up and transport.

Mirka's new 5" DEROS (Direct Electric Random Orbit Sander), though…I'm wholly impressed. This 4,000-10,000 rpm variable-speed tool replicates all that's praiseworthy about the CEROS, but it plugs directly into a typical household wall outlet. No more external power pack. Plus, the power cord is integrated into the 18' dust-collection hose (a 30' hose is also available), so it never gets in the way.

At just 2.3 pounds on our postal scale, the DEROS weighs less than the Ridgid R2601 electric random-orbit sander (ROS) I bought for use at home (3.4 pounds).

In December, I sanded my butcher-block countertops and leveled the walls and ceiling of a room that formerly featured faux Venetian plaster. On two walls and half a ceiling, and on one counter, I used my Ridgid; for the second room and other counter, I used the DEROS. Less weight, coupled with better balance and control because your hand is much closer to the work, makes a huge difference – particularly when sanding overhead and on vertical surfaces (I had a lot of both on the walls).

The tool's height is 3¾"; Porter-Cable's 390K low-profile ROS is 4⅜" in height, which is already 1" or so shorter than other ROS models). And the on/off – the paddle on top – is a lot more convenient than the typical side-mounted switch.

The dust collection difference between the two, both hooked up to the same Festool CT mini vacuum, and with the same sanding discs (Abranet), was also noticeable; I had far less clean-up on both wood and plaster with the DEROS.

It's also quiet; I didn't have a decibel meter handy at home, but it passed the "cat test" – they didn't run. (The company's literature states the dBs as 71.)

The one sticking point is the price; at almost $600, this sander is significantly spendier than other consumer electric sanders. But the technology and performance are also significantly better. So while I'm not ready to say goodbye to my Ridgid (I can't bear to bin an adequate tool, particularly one I don't use often), when the time comes for a replacement, I will shell out the extra dough for better performance, better dust collection and ease of use. There is likely a lot more plaster work in my future when I find a new old house to rehab, so it will be worth it.

— Megan Fitzpatrick

CONTINUED ON PAGE 14

Fast & clean. *The Mirka DEROS sander performs like an air-powered tool – and the dust collection is amazing. The damp paper towel at right contains all the residual dust wiped from a 9' butcher-block counter after sanding.*

DEROS Sander MID550201

Mirka ▪ mirka.com/deros or 330-963-6421

Street price ▪ from $595

▪ VIDEO *Find out more about the DEROS in a free Popular Woodworking video.*

Price correct at time of publication.

SANDER & CHARGER PHOTOS BY AL PARRISH, PARTING TOOL PHOTO BY CHRISTOPHER SCHWARZ

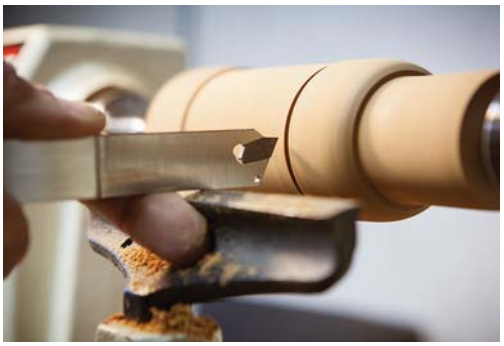
CONTINUED FROM PAGE 12

Easy Wood Tools 1/8" 'Easy Parter' Parting Tool

Since my first experience with Easy Wood tools in 2011, I've been a fan. Thanks to the tools' long-lasting carbide inserts, I can focus on the shapes I want to produce instead of heading to the grinder or tweaking the lathe's tool rest.

The three basic tools in the Easy Wood catalog – the rougher, finisher and detailer – do about 95 percent of the shapes a furniture maker could want when working between centers.

But the one tool that was missing from the line-up was a parting tool.



Easy Wood has remedied this with a new 1/8" parting tool that makes fine details as small as 1/8" wide that were impossible with the basic set.

As with the other Easy Wood tools, the Easy Parter has a replaceable carbide tooth. But unlike the company's other tools, it isn't changed with a screwdriver. Instead, you use a key (included) that slightly pries open the tool's jaws, allowing the tooth to drop out. Then you put in a new tooth and release the key. It takes 20 seconds.

I have found the Easy Wood carbide inserts to be incredibly long-lasting. If I am careful, I can turn the parts for as many as 10 Roorkee chairs before requiring a fresh edge.

The Easy Parter works just like all the other Easy Wood tools. You hold the handle parallel to the floor and gently push the tool into the work. It cuts smoothly and quickly.

My only quibble is that the cutting edge of the Easy Parter is about 3/16" higher than the cutting edge on my other Easy Wood tools, so I have to lower my tool rest to use the tool. But that's a small price to pay for avoiding the grinder.

— Christopher Schwarz

Easy Wood 1/8" Parting Tool

Easy Wood ▪ easywoodtools.com or 866-963-0294

Street price ▪ from $120

▪ **BLOG** *Read more about Easy Wood tools and the company's origins.*

Price correct at time of publication.

Bosch 'Power Ready' Wireless Charging System

Although wireless charging is nothing new (it's been around for years for home and mobile phones), the Power Ready system from Bosch is a first in the tool sector.

As of this writing, the system includes only the WCBAT612 18-volt thin-pack 2Ah battery ($89), which is backward-compatible with all of the company's 18V lithium-ion tools. But a press release states that this spring Bosch will introduce fat-pack 4Ah batteries to the wireless lineup. (Both will also charge on a traditional charger.)

I was skeptical at first, because you do, after all, still have to find a plug for the charger (WC18C; $59) and remember to put the tool atop it. But I used the system in the shop for a few weeks, and (after I trained myself to put it back where it belongs) it really is faster and more convenient than switching out the batteries…and hoping your backup battery is charged.

A benchtop charger frame (WC18F; $12) keeps the battery properly aligned to charge, but if you don't use the frame (I did not) pay attention to the light display; green means it's working – and without the frame, it's a little fussy to align things correctly. There's also a holster-style frame (WC18H0l; $49) available to mount the charger and a drill on the wall (or in a work truck).

It takes just under an hour to reach a full charge from empty, and about 30 minutes to reach an 80-percent charge – but if you keep the tool where it belongs when it's not in use, that's never an issue. And of course it stops charging when the battery is full.

The inductive charging (an alternating magnetic field) works only when a compatible battery is on the pad. And the pad won't function if it identifies a foreign object, such as a screw or metal shavings. **PWM**

— MF

Wireless Charging System

Bosch ▪ bosch.com

Street price ▪ from $138 (for the battery & charger)

▪ **BLOG** *Read more about this system and see it in action.*

Price correct at time of publication.

Killer Wood

Don't let fabulous figure overshadow your design elements.

Much has been written about how Michelangelo, the great artist and sculptor, spent years of his life in the Carrara, Italy, marble quarries. He sought out promising stone and often took part in the whole process, from the initial sectioning of blocks from the mountainside to the actual supervision of transporting stone to his studio in Florence.

One note of interest: The master sculptor had the enormous blocks roughed down close to their finished forms while still on the quarry floor. He provided drawings to guide the rough stone cutters and in this way minimized the cost to transport the massive stones.

Some things never change. Outstanding stone or wood is always in short supply and expensive. Yet there are hardly words to describe the bliss as a rough chunk of figured grain shimmers at first light.

Our ancestors long ago learned how to exploit the useful properties of wood. They knew that the toughness of elm made a wagon wheel hub that could take a beating, and that the elasticity of English yew could lend its power to an archer's bow.

Yet aside from its countless utilitarian qualities, wood occasionally shows flashes of glory. Like our ancestors, we can't help but be dazzled by the shimmering grain and tangled brushstrokes painted by nature in the face of a board.

Responsible use. *Rich claro walnut (top) and figured mahogany deserve our finest design efforts.*

Figure Can't Trump Form

There are no magical design formulas that come into play before we plunge a saw into some ridiculous claro walnut, but it's obvious the stakes are higher.

The good stuff, what the lumbermen call their "private stock," is rare and costly. That alone gives pause. But for me it's the thought that nature offers up a special gift, created by storms, hardship, frigid winters, blistering droughts and a bit of mystery. I don't take that lightly, and I always desire to make something worthy of the special material.

It's also important to note that, although dramatic figured wood can make a profound statement, it cannot make up for a poor underlying design. Ask yourself before committing that special wood: Will this design hold up even if it were made with tulip poplar or construction pine?

That's actually a good question to ask before applying carving, marquetry or outstanding wood to any project. If the underlying bones are good, that blistered maple may transform it into something great. If the form itself is lacking, the best wood in the world will not make up for it.

Don't Fight It

I've always had a soft spot for figured maple and early on was eager to see how other woodworkers past and present used it to maximum effect. One thing I noted is that it's very rare for it to show up in heavily carved sculptural work such as ball-and-claw feet.

I posed the question to a few experienced carvers and always heard the same answer: Figured wood is troublesome to carve and therefore one to avoid. No doubt that's one of the primary reasons it's seldom carved.

Yet, one important maxim in design is that, any time we pair two different things, the goal is always that each will complement and bring out the best in the other. Together, the pairing results in something more than just the sum of the two.

Plunging a gouge through the sur-

CONTINUED ON PAGE 18

LEAD PHOTO & DRAWINGS BY THE AUTHOR; BLACK WALNUT & MAPLE PHOTOS BY HORIZON WOOD PRODUCTS

CONTINUED FROM PAGE 16

face of a figured wood often kills the striking grain. Instead of the dramatic tiger stripes dancing across the surface of a flat board, it takes on a mushy look when sculpted into a curved or irregular surface.

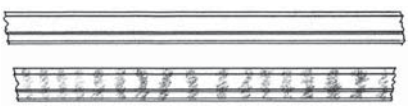
Worse, in the random spots where the figure shows through the surface, it visually fights with the carving itself. It defeats the whole purpose, almost like two trumpets playing different music with a different beat.

The same can be said for mouldings. Although it's tempting to try to add some pop to mouldings by using figured wood, we have to understand what we are trying to accomplish. The primary purpose of mouldings is to add depth by producing strong bands of light and shadow.

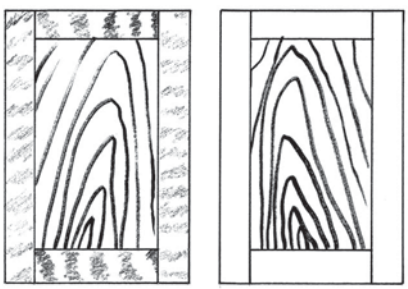
Figured stock, aside from its difficult working properties, will only detract from the very effect we are trying to accomplish. The shimmering grain actually takes away from the sense of depth we are trying to achieve through shadow lines.

Make Beauty Stand Out

Carvings and mouldings both hint at something important about using dramatic wood. Less is more.



Indistinct shadows. *Mouldings are nothing more than bands of light and shadow. Figured grain actually muddies the shadow lines.*



The right frame. *A plain or figured door frame – which takes away from the dramatic grain in the panel?*

Sawn revelations. *Bird's-eye black walnut anyone? Nature never ceases to unveil surprises.*

Hidden treasure. *How about a bubbly? The boiling surface of this figured maple shimmers even in the rough-sawn state.*

That amazing curly koa will have a much more dramatic effect if we frame it in a way that allows the beauty to stand out. That means we use restraint in our selection of wood to frame it. It's best to frame in either plain wood or, at most, a contrasting wood tone that complements the striking panel.

As tempting as it is to construct door frames and banding from wild grain, if we want to showcase the dramatic, it's best to play it off something understated.

We underestimate the craft tradition when we think the period woodworkers opted for straight-grained woods in door frames simply because it was easier to work with hand tools. Discriminating builders know that the frame is not the star. It's the panel inside the frame. Let the door panels sing by letting the backup singers do just that – play backup.

It seems a bit counterintuitive, but in the end this will make that special wood shine brightly and take your work to another level.

Many Thanks to the Sawmill

Finally, it's important to note that, although rare and beautiful wood is expensive, it's not the place to scrimp.

When I look back over furniture I've built, I never regret spending more for that burl wood or that really dense walnut. If you are lucky enough to find a lumberyard that carries great wood, consider yourself fortunate.

The better ones, such as Horizon Wood Products, not only carry amazing wood but also understand the needs of furniture makers.

My only regrets are that I didn't buy more, not less. **PWM**

George is the author of two design DVDs (Lie-Nielsen Toolworks) and writer of the Design Matters blog.

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Ruhlmann Tabouret

BY MARIO RODRIGUEZ

Create sultry sophistication with Art Deco details.

Émile-Jacques Ruhlmann (1879-1933) is considered by craftspeople, collectors and designers to be the premier Art Deco furniture maker; he was called "Art Deco's greatest artist" by *The New York Times* in 2009. All the fuss is for good reason.

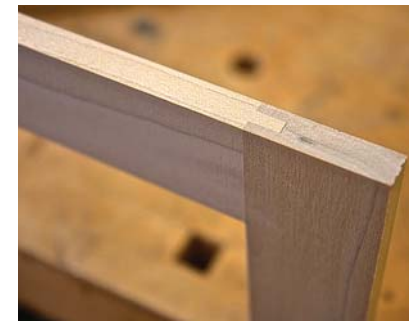
This French designer's work is characterized by the skillful use of luxurious and exotic materials, including ebony, kingwood, ivory, amaranth, Indian rosewood, sharkskin and tortoiseshell. What really set his work apart was how he perfected a purity of line – lithe sinuous curves melding perfectly with sharp, disciplined and crisp rectangles and straight edges.

Ruhlmann insisted on uncompromising quality, and as a result, his pieces consistently lost money, sometimes as much as 20 to 30 percent. For example, it typically took more than 50 hours to create a single leg for a piece. The exquisite workmanship invested into his pieces is immediately obvious to any viewer.

My original design is strongly influenced by Ruhlmann's collective work and employs a number of details he often used on his amazing furniture. These include the inlaid dot border, contrasting accents, vertically oriented veneer work and slender tapering legs on this piece.

The design is called a tabouret, or work table. Set alongside a desk or drawing board, it would store and organize frequently used tools and materials. But its small size (about 19" wide x 15" deep x 31" high) makes it a piece that can be placed anywhere – in an entryway, at the end of a sofa or next to a bed.

Solid. *Web frames add rigidity to the case and provide surfaces on which the drawers ride. They are housed in 1/2"-wide dados in the case sides.*



Stubby but strong (enough). *Stub tenons are a quick and sturdy solution for frames that don't support a lot of weight.*

Innards first. *The carcase is assembled around the web frames, then the back drops into rabbets in the sides.*

Carcase & Web Frames

The carcase sides and back are made of 3/4" shop-grade plywood. After cutting the parts to size, I cut 1/2"-deep x 3/4"-wide rabbets on the back edges of the side panels to receive the 3/4"-thick back, and across the top ends of the side panels for the upper drawer web frame. Next, I cut 3/16"-deep x 1/2"-wide dados into the sides for the other drawer web frames.

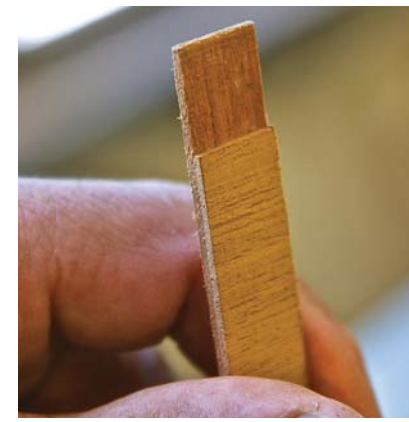
The frames are made of 1/2" poplar and are joined with stub tenons set into a lengthwise groove. Once glued up, they are cut square and to final size. And because the 3/4" plywood cabinet sides and back are assembled around these three poplar frames, they must be perfectly square and dead flat.

In addition to holding the sides and back of the carcase together, the frames support and guide the smooth operation of the two dovetailed drawers.

Top it Off

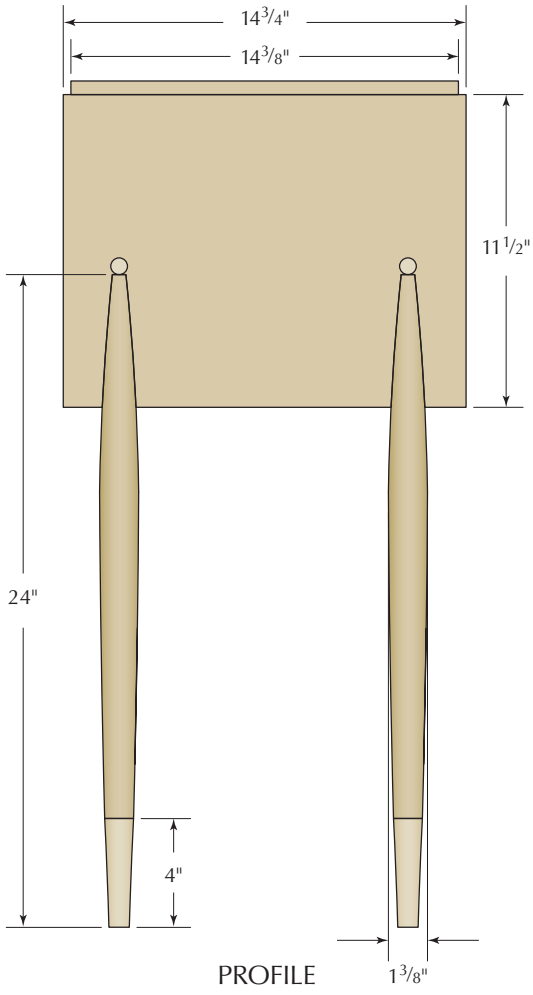
For the top's substrate, I used 1/2"-thick birch plywood.

I'm always aware of how delicate and vulnerable a veneered surface is and that any light blow could damage the surface and reveal the substrate below and destroy the illusion. So to provide more protection to the edge, I laminated 1/16" shop-sawn cross-grain mahogany veneer to a foundation strip of 1/16" long-grain veneer.

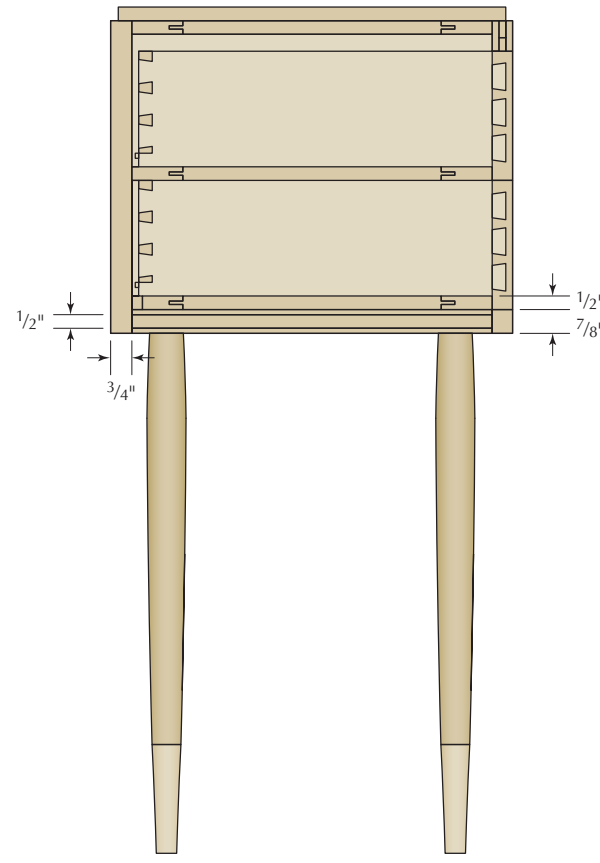


Composite edging. *To add some strength to the top's edges, I laminate the cross-grain veneer to a strip of long-grain veneer.*

LEAD PHOTO BY AL PARRISH, STEP PHOTOS BY THE AUTHOR; ILLUSTRATIONS BY DONNA R. HILL FROM THE AUTHOR'S DRAWINGS



PROFILE



PROFILE SECTION

This makes handling the cross-grain banding easier and also provides critical thickness to the edge as protection against future accidents (as well as against sanding through the veneer during construction).

Glue the edging and hold it in place with luthier's tape. After it's dry, plane and sand the edging flush with the top's surface.

Sticky solution. *After applying glue to the edge, hold it in place with luthier's tape until the glue sets.*

Center field. *After the glue sets up overnight in the press, trim the edges of the field 1 5/8" back from the substrate's edges.*

Bookmatched Center Field

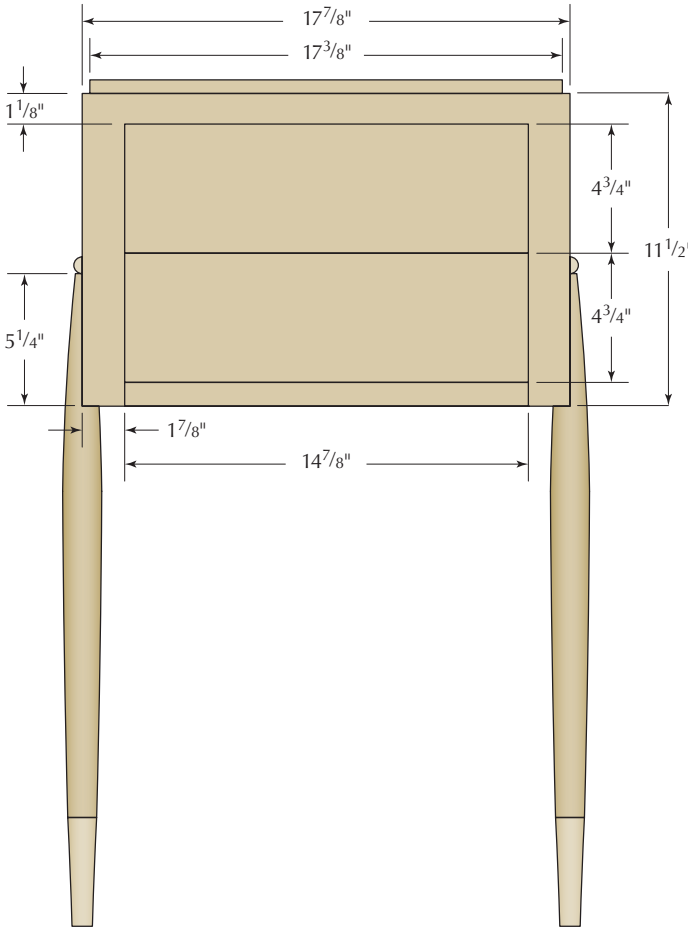
After pressing the bookmatched leaves flat, shoot the edges with a block plane to ensure they are straight and matched, and tape them together. Glue them to the substrate panel using cold fish glue; set the work in a giant manual screw press overnight. Then carefully trim the veneer 1 5/8" back from the panel edges.

I cut the cross-grain borders 1 3/4" wide and pre-cut the miters for a precise fit at the corners. The extra 1/8" in width allows me to make last-minute adjustments necessary for perfect, tight-fitting miters.

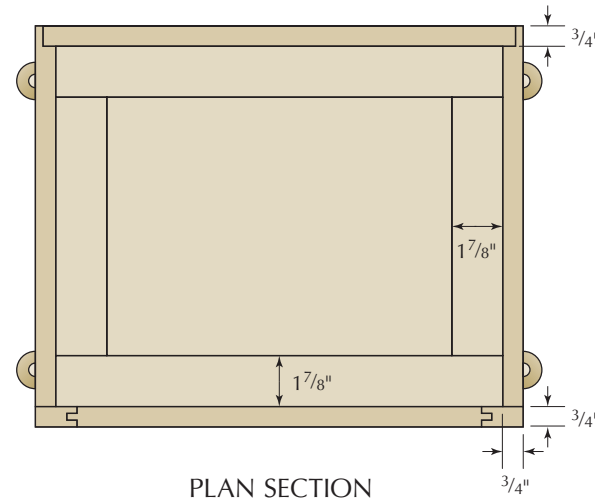
Glue down the border, one piece at a time, using yellow glue and clamping cauls (cover the cauls with any non-stick tape). As I unclamp one segment, I set the next in place, taping across the miters to ensure the joint won't open up later or shift while it's clamped. After just a couple of hours of drying time, trim everything flush using a sharp veneer saw. Remember how the grain of the overhanging veneer is oriented and trim it with great care.

String the Panel

I use a Dremel with a 1/16" milling bit, attached to a router base, to cut a 1/8"-deep



ELEVATION

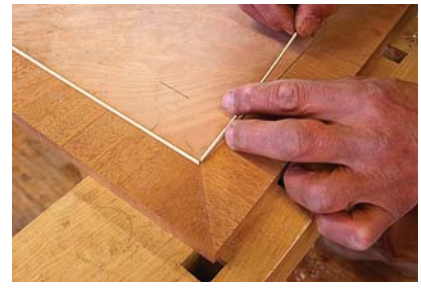


PLAN SECTION

Straight & true. *To cut grooves for the stringing, I use a Dremel in a router base. Notice the clamped straightedge that guides the tool.*

x 1/16"-wide channel for the 1/16" holly stringing that is installed all around the center bookmatched panel. (Clamp a straightedge to the top to guide the router base.)

Using a thin-kerf 10" table saw blade and a zero-clearance insert, carefully rip the 1/16"-thick stringing; then use the band saw to rip those wider strips into 1/4" stringing material.



Get into the groove. *After mitering the corners, glue the holly inlay strips in place.*

After mitering the ends with a chisel and a miter block, I fit the stringing into the grooves, then glue it in place with the rough edge up.

Later, it's planed and sanded flush (when you do that, be careful not to cut through the veneer).

Dotted Edge

A bright staccato band of dots that neatly punctuates the slender top to give it a little "pop" is a Ruhlmann trademark.

These 1/8"-diameter dots are cut using a punch made from a 2 1/2"-long piece of 1/8" inside-diameter stainless steel tubing with "saw teeth" cut into one end. Use a 4" XX tapered slim saw file to cut the teeth and to slightly taper the outside diameter.

With the punch chucked into a drill press, lower it slowly (and at a slow speed) into a slice of 3/16"-thick holly. After punching out three dots, remove the tube from the drill press and push out the dots before proceeding. Attempting more dots at one time clogs the tubing and crushes or "burns" the dots. Any damaged or discolored dots will show badly, so cut extras and discard those that are less than perfect. You'll need 80 good ones…and a few extras for insurance.

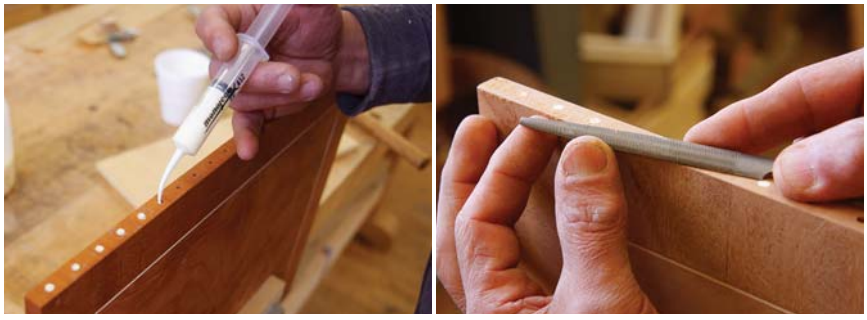
Dots. *You'll need 80 holly dots (plus a few extras for insurance). Note the "saw teeth" on the punch.*

Ruhlmann Tabouret

NO.	ITEM	DIMENSIONS (INCHES) T	W	L	MATERIAL	COMMENTS
❑ 1	Top	1/2	14 1/8	17 1/8	Plywood	Veneer*
❑ 2	Sides	3/4	11 1/2	14	Plywood	Veneer after assembly*
❑ 1	Back	3/4	11 1/2	17 3/8	Plywood	Veneer after assembly*
❑ 6	Web frame rails	1/2	1 7/8	10 1/2	Poplar	
❑ 6	Web frame stiles	1/2	1 7/8	16 3/4	Poplar	
❑ 1	Face frame rail	3/4	1 1/8	15 5/8	Mahogany	Veneer after assembly*
❑ 2	Face frame stiles	3/4	1 1/2	11 1/2	Mahogany	Veneer after assembly*
❑ 4	Legs	1 1/2	1 1/2	21	Mahogany	Oversized for turning*
❑ 4	Feet	1 1/4	1 1/4	4 1/2	Holly	
❑ 2	Drawer fronts	3/4	4 3/4	14 7/8	Mahogany	Veneer*
❑ 4	Drawer sides	5/16	4 1/4	13 1/2	Spruce	
❑ 2	Drawer backs	1/2	3 3/4	14 7/8	Spruce	
❑ 2	Drawer bottoms	3/16	13 3/8	14 1/2	Spruce	
❑ 1	Staging panel	1/2	12 1/2	13 1/2	Spruce	**
❑ 2	Breadboard ends	1/2	1 5/8	13 1/2	Spruce	
❑ 1	Staging panel front	3/4	7/8	14 7/8	Mahogany	Veneer*
❑ 4	Drawer guides	7/8	7/8	11	Maple	
❑ 2	Panel guides	7/8	1 1/4	13 3/4	Maple	
❑ 6	Knobs	1 1/4	1 1/4	2	Holly	
❑ 2	Leg-dot balls	5/8	5/8	1 1/2	Holly	

*Veneer: Crotch mahogany for center field, straight-grained mahogany for the balance, plus holly stringing for the top. **Includes stub tenon both ends

Tape in place. *Lay out the dot locations on a piece of tape, bringing the lines to the table edge. A simple jig helps to align your drill bit and keep it straight; a stop-block on the bit keeps you from drilling too deep.*



Dotted line. *Use a syringe to inject glue into the holes, then insert the dots all along the edges. When the glue is dry, file the dots flush, then sand.*

To position and drill the holes into the edge of the top, make a simple drilling jig (see image below). Lay out the exact position of each dot on strips of tape laid onto the top, then clamp the jig to the top, drill a hole, and move the jig to your next mark.

Inject a small amount of glue into each hole (I use a Monoject #412 plastic syringe) and gently tap the dots into place, leaving each slightly proud.

After the glue dries, work each dot flush using a detail file, then sand the entire edge smooth with #220-grit sandpaper.

U-shaped Face Frame

I attached an open U-shaped face frame to the cabinet to strengthen the carcase. The frame also visually alters the piece, giving the cabinet a more tailored and formal look, and it reduces the drawer opening.

The frame is made up of three mahogany pieces joined with stub-tenon and open-mortise joinery, with the grain running in the conventional direction.

The pieces are veneered with the same mahogany veneer that covers the carcase (see below) to maintain a neat and uniform appearance. The grain of the veneer on the face frame rail is oriented vertically. Because of the narrow size, I veneered the frame-face parts using yellow glue and clamping cauls.

Once the face frame parts are veneered and the joinery is complete, glue up the frame. (I used a spacer along the open bottom of the frame to maintain critical dimensions and to ensure squareness.)

Veneer the Carcase

For the plywood carcase, I chose straight-grained mahogany for its warm, even color and absence of fig-

"The man who has had the greatest influence on designer-craftsmen of furniture in the last 100 years is undoubtedly Émile-Jacques Ruhlmann."

—Silas Kopf, from "A Marquetry Odyssey"

Face front. *The face frame is joined with open mortise-and-tenon (stub tenon) joints; make sure everything is square before you glue up.*

ure. Because the case was already assembled, I employed the traditional method of using hot hide glue and a veneer hammer to lay down the veneer.

After brushing warm glue onto the cabinet, place the veneer face down onto the wet glue and apply glue to the backside of the veneer. While it's still wet (and warm), flip the veneer face up and quickly began to press it down with the hammer, squeezing out the excess as you carefully work toward the edges before the glue cools.

After thoroughly pressing down the veneer, I check for any stubborn, unglued edges and bubbles. These can be reheated and eliminated with the application of more glue (or heat from an iron) and additional focused pressure until a good bond is achieved. Later, trim the excess with a veneer saw, then plane and scrape the seams smooth before sanding with #220 grit. Add cross-grain veneer to the reveal on the carcase top.

Time for Shapely Legs

I mill my leg stock 1½" square x 21" long, then cut out a ¾" x 5¼" section at the top of each leg. This cut-out section is replaced with a piece of poplar glued in with a slip of heavy brown paper placed between the poplar and the leg blank. This allows easy removal of the poplar once the leg is turned.

Leg prep. *Before turning the legs, cut out a ¾" x 5¼" section from the mahogany and glue in a piece of poplar, with heavy brown paper between the two species.*

Hot hide. *The carcase is veneered in the traditional manner, using hot hide glue and a veneer hammer. It's not difficult, but you must work quickly.*

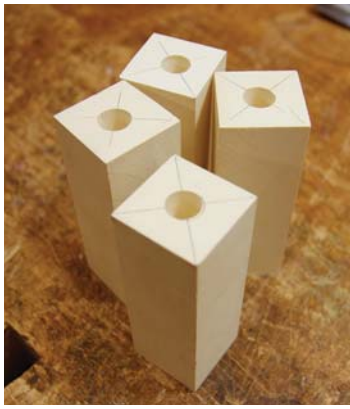
Next, turn a ½"-diameter x 1"-long tenon on the bottom of each leg.

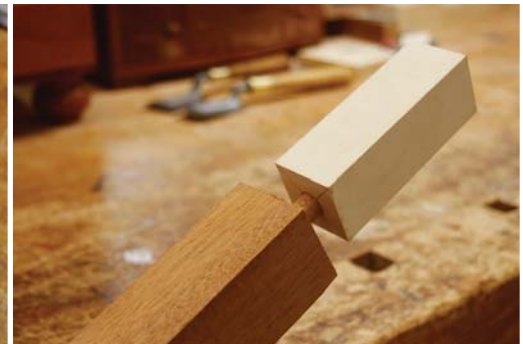
For the feet, I prep 1¼" x 1¼" x 4½" holly blanks, then drill a ½"-diameter hole into one end and glue them to the tenons on the bottom of the mahogany leg blanks.

Holly is a hard, tight-grained wood that can be turned to a smooth, ivory-like surface. It is the perfect choice for the feet, knobs and other light-colored accents on this piece.

I describe the leg as a "torpedo" shape, tapering to ½" at the top and ¾" at the foot, with a 1⅜" swell at the thickest point.

After turning the legs to a rough shape with a roughing gouge, I clean and smooth the taper starting with my Ashley Isles "3-1" gouge (Item #IT-MA-RIO125 at Tools for Working Wood), then switch to a 1½" skew gouge. I finish up with a block plane.





The drill. *Prep, then drill the holly foot blanks to slip over the mahogany leg tenons.*

Foot joint. *Use a small block plane to smooth the transition from holly to mahogany (mine is a Lie-Nielsen No. 102).*

After turning the legs to their final shape and removing them from the lathe, remove the glued-on poplar section by gently guiding a chisel into the seam between the two woods. This leaves a clean-cut ledge on the mahogany leg, which will eventually fit against the side of the carcase.

Staging Panel & Drawers

The slender panel that slides out from beneath the drawers at the bottom of the carcase is used to briefly support, display or organize tools and materials.

I made up a 1/2"-thick panel with breadboard ends and joined the front of the panel to a strip of mahogany (that will line up with the drawer fronts) with a short, continuous tenon. This strip is veneered with the same vertical-grain mahogany as the drawer fronts and face frame for a pleasing waterfall effect.

The staging panel hangs in a pair of U-shaped guides, which are screwed to the underside of the bottom web frame. By screwing the guides in place, I can adjust their positions to provide smooth and easy travel for the staging panel.

Staging strip. *The front of the staging panel is attached with a stub tenon that stops just short of either end.*

"U" for underhung? *The staging panel rides in U-shaped guides attached to the underside of the bottom drawer's web frame.*

SUPPLIES

Stewart-MacDonald
stewmac.com or 800-848-2273

1 ▪ Binding tape
#0677, $4.89

1 ▪ Router Base
#5260, $53.65

Prices correct at time of publication.

I cut the drawer fronts to their exact size and veneer the fronts with vertical-grain mahogany. As I did with the carcase face frame, I veneered the fronts with fish glue in a cold press.

The drawer sides, backs and bottoms are made of quartersawn sitka spruce (leftovers from a guitarmaker). This stuff has a beautiful, straight grain and a creamy color well-suited to this piece. It's also surprisingly strong, enabling me to mill the stock down to 5/16" for the sides. The backs are 1/2"-thick; the bottoms are 3/16" thick.

The drawer sides are joined to the fronts with hand-cut half-blind dovetails, and to the back with through-dovetails.

The drawer bottoms are inserted with the grain running side-to-side; that way any wood movement is directed toward the back of the drawer. To accommodate that movement, I insert a screw and washer through open slots cut into the back of the drawer bottom.

I build drawer boxes slightly larger than the opening, which allows me to plane them down for a perfect fit, one stroke at a time.

Before fitting the drawers, glue wood drawer guides onto the drawer webs. These guides take up the space between the carcase interior and the face frame. By handplaning them, I can tweak them to provide smooth travel for the drawer boxes and create even spacing of the drawer fronts.

Turn the Knobs

For the holly knobs, prep several blanks to 1 1/4" square by about 2" long.

Once they are turned round to 3/4" diameter, I put them in a collet chuck. This allows me to turn a tenon (3/8"-diameter) and knob without having to remove and re-chuck the blank.

Half-blind. *At the front, the drawers are joined with half-blind dovetails (through-dovetails are used at the back).*

Allowance. *Hold the drawer bottom in place with a washer and screw in a slot to allow for seasonal wood movement.*

Guides. *Drawer guides should be fairly tight to the drawer sides to keep things from binding. Fit them by hand for smooth travel.*

Once the shape is complete, I sand and burnish each knob to a super-smooth finish while it's spinning on the lathe.

The tenons are inserted in holes drilled on the drawer and staging panel fronts. Turn the tenons for a tight fit so they won't loosen over time. Setting them is a small challenge. To embed the knobs gently, I use a wooden handscrew to press them into place (rather than knocking the crown).

Leg Punctuation

At the top of the legs are 1/2"-diameter round dots. As with the knobs, I turn these on the collet chuck, leaving a generous tenon.

After turning and sanding the two small balls, I stick the tenon into a block for support and saw the balls down the middle on the band saw. Then, saw the two halves free from the tenon.

Legs, Meet Carcase

The torpedo-shaped legs are attached to the case with sliding dovetails. This is a perfect way to set the cut-away surface tight to the sides of the cabinet and produce a strong joint. Another benefit of this method is that any error in placing the legs is easily corrected.

I begin by milling 3/4" wide, 8° dovetail slots in the carcase with my router, a 3/4" dovetail bit and a 3/4" outside-diameter rub collar. A template guides the rub collar and sets both the position and length of the dovetail slot (see photo above). With the template clamped to the case, I can cut the slots in a single pass.

Now mill some mahogany scrap to 13/16" thick, tilt your table saw blade, and cut both edges to 8° to match the slots. After testing the fit of the dovetail key into the slot, cut the keys free. With a few passes of a block plane, trim the keys to a precise fit, then cut them to length.

Drill a pair of countersink holes into each key, then screw the keys to the legs using 3/4"-long #6 wood screws. Check the fit and registration of each leg. Once you're satisfied with the fit and appearance, dismantle everything, apply glue, then reattach the legs.

With the legs glued to the carcase, glue the leg dots at the ends and tape them in place until the glue dries.

Then sand all surfaces to #220 grit (be careful not to cut through any veneer). If you have spray equipment, use it to apply at least two coats of satin lacquer. I've also experimented with General Finishes' High Performance Polyurethane Water Based Top Coat, which imparts a nice, protective sheen. (And of course, feel free to experiment with other finishes on scrap.)

Now all that's left to do is decide where in your home to display your elegant Ruhlmann-inspired work. PWM

Mario is a long-time furniture designer, maker and teacher; he now offers classes at the Philadelphia Furniture Workshop.

Gently, now. *A wooden handscrew provides sufficient pressure to push the knob tenons in place without damaging the faces.*

Tiny turnings. *The leg punctuation dots are held in a collet chuck and turned to shape using a file.*

Safe cut. *Use the tenon on the end of the ball to secure it in some sacrificial wood. Then cut each ball in half at the band saw.*

Quick slots. *A simple jig of 3/4" plywood guides the router's rub collar to make quick work of the leg dovetail slots.*

Keys. *Use mahogany scrap to make the keys at your table saw, then plane them for a precise fit before cutting them to length.*

Applied keys. *Screws hold the dovetail keys in place on the back of the legs.*

Finishing touch. *The dots atop each leg provide the final punctuation.*

ONLINE EXTRAS

For links to all online extras, go to:

- popularwoodworking.com/apr15

WEB SITE: *Visit the author's web site for information on upcoming classes.*

VIDEO: *See Mario Rodriguez's ingenious solution for scooping a chair seat.*

TO BUY: *"Building a Classic Drawer with Alan Turner" (who also teaches at Philadelphia Furniture Workshop).*

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- ShopWoodworking.com

Tapered Sliding Dovetails

BY FRANK STRAZZA

Hand tools are the way to go for this traditional joint.

Tapered sliding dovetails are multipurpose joints traditionally used for drawer dividers, holding legs in place on a pedestal table and attaching tops to case pieces.

The primary reason for a tapered joint (instead of a straight joint) is the reduced friction over its length. The tapered sliding dovetail gets tight only during the final fit, when it is ready to seat home. This reduced friction makes fitting much easier.

Once the joint is seated, it is extremely tight and often requires no glue. Hand-cutting this joint is easier and quicker than the lengthy process of setting up a jig and machine.

After incorporating tapered joints into much of my furniture, I've found them strong and multifunctional; I believe you'll enjoy their benefits, as well as the challenge of cutting the joint, as much as I have.

Below, I'll show you how to create a small tapered sliding dovetail, such as would be used for a drawer divider.

Tail Layout

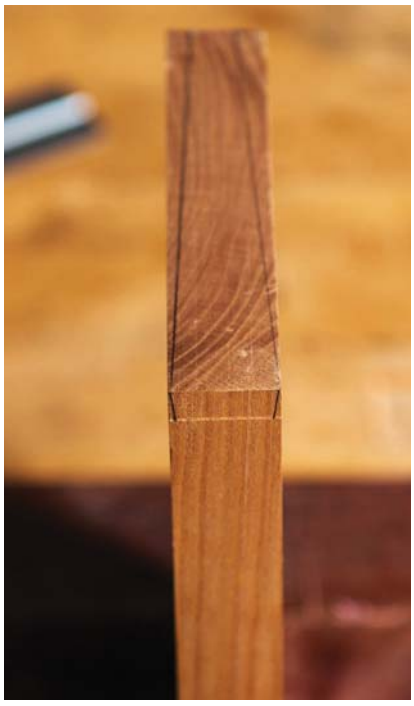
For this exercise, I use two 3/4"-thick x 4"-wide cherry boards (a typical size for a drawer divider).

The first step is to cut the tapered tail (after making sure that the end of your board is perfectly square).

Set a cutting gauge (not a pinned marking gauge, which would tear the fibers rather than cutting them) to 1/4" and scribe all around the end of the tail board to mark the baseline. On the board's edge, the sliding dovetail appears identical to a regular dovetail. However, from above, there will be a taper.

Place the tail board upright in your vise in preparation for marking tapered lines on the end grain. Starting with the

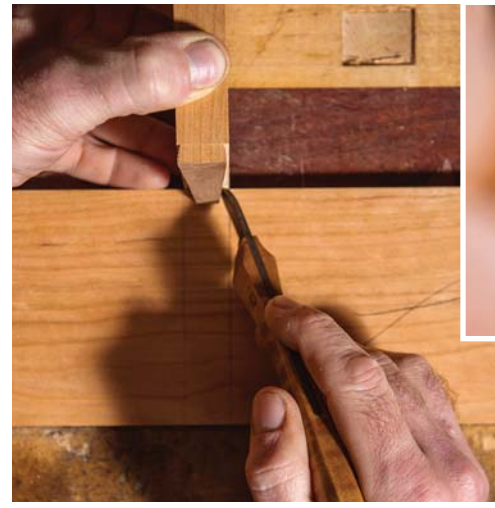
PHOTOS BY BEN OWEN



Tail layout. *After marking the baseline at 1/4", mark the taper on the end grain.*

Tail cuts. *I use a dovetail saw to make the tapered cuts; notice how I use thumb pressure against the saw to keep it correctly aligned to the cut.*

Chiseled wall. *Use a chisel to create a "wall" against which you can register your saw.*



Narrow, then wide. *First, mark the small end of the tail. (Note that your knife position is critical here, and be sure to mark both sides.) Then mark the wide end on the other edge of the pin board.*

end facing you, place a straightedge on the outside edge. Angle it toward the other end of the board, with a slope of about one-quarter the thickness of the board; in this case, that will be 3/16". Draw a tapered line with a pencil along the straightedge. Repeat this process for the opposing side.

Using a dovetail marker or bevel gauge, draw the lines for the tail on the edge of the board. (I like a 1:7 angle.)

Cut the Tail

Cutting the angles on the top is a bit of a challenge, but no more than sawing a tenon cheek. Starting at the back, cut partway down your line, shift the saw to the front and make another partial cut, then join the two cuts. It is helpful to apply pressure between your thumb and the side of the saw to keep it aligned.

It's important that the two tapers on the end grain are straight and that the angles that make up the tail are cut accurately. Remember – you are only cutting down 1/4".

Cut the Shoulder

With a knife, deepen the shoulder line that you marked with your cutting gauge.

Now use a chisel to create a wall right against the knifed line. That creates a nice shoulder to set your saw against to use as a guide for accurate cutting. (This method is effective for extreme accuracy in cross-grain cuts.) But don't overcut! Inspect the tail to ensure that the shoulders are crisp and clean.

On occasion, I use a sliding dovetail plane to cut the tail, but I've found it not as effective for a narrow tail such as this one. (However, if you're creating a long sliding dovetail, such as on a tabletop, the plane is essential.)

> "Opportunity is missed by most because it is dressed in overalls and looks like work."
>
> —*Thomas Edison (1847-1931), American inventor*

Mark & Cut the Pin

The next step is to transfer the tail to the pin. Mark two pencil lines square across the pin board to indicate the width (3/4") and placement of the tail board. Draw a face mark on the inside of your pin board on the right-hand side and another one on the right-hand side of the tail board. These marks should face each other; they will help you keep the alignment correct.

Lay your tail board on edge with the small dovetail end touching the pin board, with the end grain facing you. With your knife closest to the shoulder, mark the small end of the tail on both sides. Now flip the tail board end to end

Waste removal. *Work in from both sides to remove the waste. On the wider side, a 3/8" chisel is the best choice; working from the narrower side, switch to a 1/4"-wide tool.*

Cordless router. *Level the floor of the socket using a small router plane.*

so the end grain faces away from you. Mark the large end of the tail on the edge of the pin board closest to you, marking both sides right at the shoulder.

The key is transferring an image of the narrow section of the tail onto the pin board.

With a straightedge, join the marks for both tapers front to back. Then with a knife, lightly scribe along the straightedge. Remove the straightedge and go over the knife cuts several times to deepen the lines.

Transfer the 1:7 angles of the tail onto the edge of the pin board.

Using the same 1/4" setting on your cutting gauge, mark the depth of the pin recess.

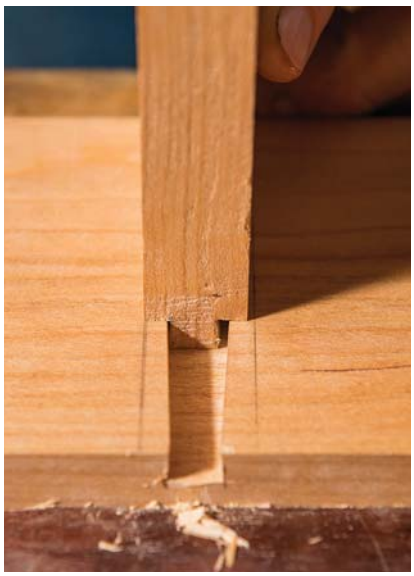
As you did for the shoulder cuts, use a chisel in your layout lines to create a wall for your saw to follow, then saw down the length of the taper line, carefully following the angle of the tail. Be sure not to overcut.

Working from both sides, remove the waste using a 3/8" and a 1/4" chisel, with the bevels facing up.

With a small router plane, remove any excess material, bringing an even depth to the floor of the pin.

Now the moment of truth! Slide the tail into the socket and use a hammer to seat it tightly. If it's too tight and doesn't go all the way home, that's a good problem. Look at both ends, and you can usually tell where the problem lies. If it's too tight on one end, simply chisel away the material on the pin board. (If it's too loose, start over with a fresh pin board.)

And don't worry if your joint isn't perfect on the first try; it took me several practice sessions the first time, too. **PWM**



Test. *Now slide the tail into its socket; use a hammer to knock it home.*

Truth. *The finished sliding dovetail joint should seat firmly in place. If you've cut it perfectly, you don't even need glue.*

Frank is an award-winning furniture maker and a woodworking instructor at the Heritage School of Woodworking in Waco, Texas.

Great divide. *The tapered sliding dovetail is my joint of choice to divide casework drawers.*

ONLINE EXTRAS

For links to all online extras, go to:

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WEB SITE: *Visit the Heritage School of Woodworking and the author's web sites.*

VIDEO: *Watch Frank Strazza demonstrate this technique in a free video.*

WEB SEMINAR: *"60 minutes to Better Furniture Design" seminar download, by Frank Strazza.*

IN OUR STORE: *"Made by Hand," by Tom Fidgen.*

Our products are available online at:

- **ShopWoodworking.com**

Kumiko Lamp

BY RANEY NELSON

The road to enlightenment is paved with lots of little strips of wood.

I am not by nature organized or detail-oriented. When I was young, I was the guy with the punk rock blaring and the messed-up clothes; the dog often ate my homework. Even as an adult, attention to detail is not my strong suit.

So it used to puzzle me why, as a craftsman, I'm attracted to detailed, obsessive and small-scale work. You'd think I'd have made a better chainsaw sculptor than infill planemaker.

I now realize my shortcomings are why I gravitate to things that seem out of character – because while I'm making tools and furniture I'm also working on myself. With each project, I improve my patience, my focus and my appreciation for details. And, in the end, making what's difficult is infinitely more satisfying than making what comes easily.

Though I'm still the unkempt guy with the music loud, work like this has made me a better craftsman.

Whether you're looking for spiritual attainment, are interested in taking your hand skills to the next level of precision or need an excuse to use a blowtorch, this Japanese-influenced

Andon-style lamp is worth the effort. It combines basic hand and power tools with a few purpose-made jigs – and a lot of attention to detail – to produce a beautiful reminder that patience is the key to wisdom.

Plus, you get to set it on fire. Sweet.

Materials

The lamp is basically a four-sided frame and panel, with an outer structure of flame-charred hardwood (see "Charred Finish," page 40) and interior panels of softwood lattice.

For the outer structure (the legs), oak, ash and hickory look great with a heavy char, while mahogany and walnut look best with a lighter char to retain chatoyance and color.

For the lattice components, straight-grained softwoods work best. "Kumiko" is the general term for the strips of wood that go into the lattice, as well as for the work itself. Traditionally, Japanese hinoki cypress is the wood of choice for kumiko. In North America, both Alaskan yellow and Port Orford cedars are similar to hinoki, and both finish beautifully. If you can't find these, white pine and basswood also work, though the results are not as crisp.

Charred. *Diffuse-porous mahogany (left) keeps some of its color and chatoyance, thanks to a film coat of shellac. Ring-porous woods such as oak (right) develop great texture as earlywood burns off.*

I made a pair of these lamps, one with oak and pine and the other with mahogany and Alaskan yellow cedar.

Kumiko Panels

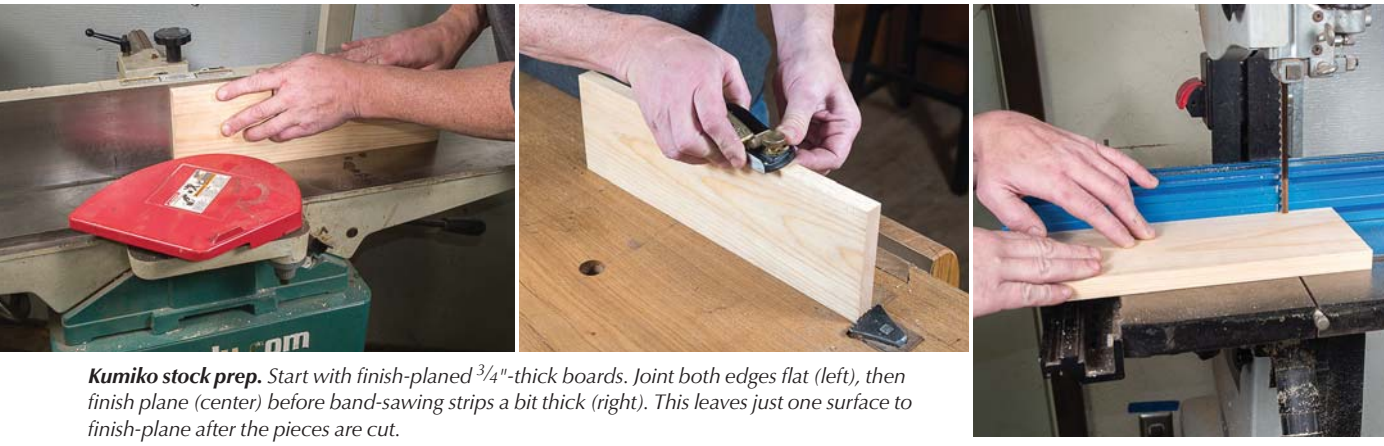
I like to save the fun part (the fire charring) for later, so I start with the kumiko frames. All the kumiko are left unfinished, so the surfaces should be planed clean with a sharp blade. The procedure I use to dimension the stock also leaves the pieces with a beautiful surface and an extremely consistent thickness.

Starting with boards milled and planed to 3/4" thick x 8" wide x 14" long, joint both edges square and flat. Then take one or two passes with a sharp plane over the jointed edges to finish this surface before sawing.

At the band saw, rip the panel-frame strips first, sawing 1/16" over the required 3/8" to leave enough material to thickness them later. Set the strips aside and take the board back to the jointer, and repeat the steps until you've got all your frame stock. Now rip the 3/16", then the 1/8" kumiko stock using the same procedure.

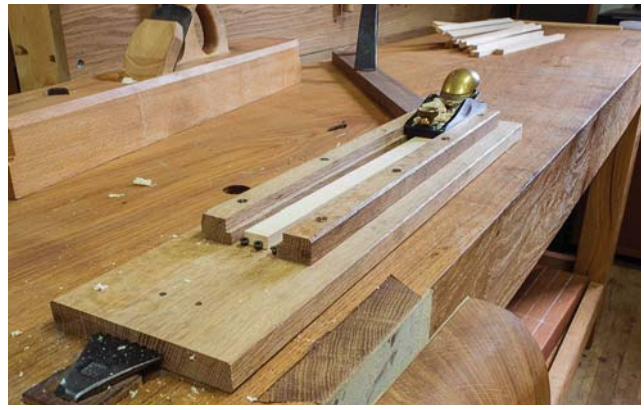
Thicknessing Jig

For these short lengths of kumiko, a simple handplane fixture does a fine job getting consistent thickness. To make the fixture, rabbet three pairs of



Kumiko stock prep. *Start with finish-planed 3/4"-thick boards. Joint both edges flat (left), then finish plane (center) before band-sawing strips a bit thick (right). This leaves just one surface to finish-plane after the pieces are cut.*

Manual planer. *The final side of the kumiko is finish-planed as it's thicknessed.*



SUPPLIES

eShoji.com
eshoji.com or 262-644-7138

1 ■ Professional shoji paper
#B444, $24.99

1 ■ Double-sided shoji tape
#Y1B, $2.99

Westinghouse
westinghouselighting.com

1 ■ Make-A-Lamp Kit
#70269, $10.56

Prices correct at time of publication.

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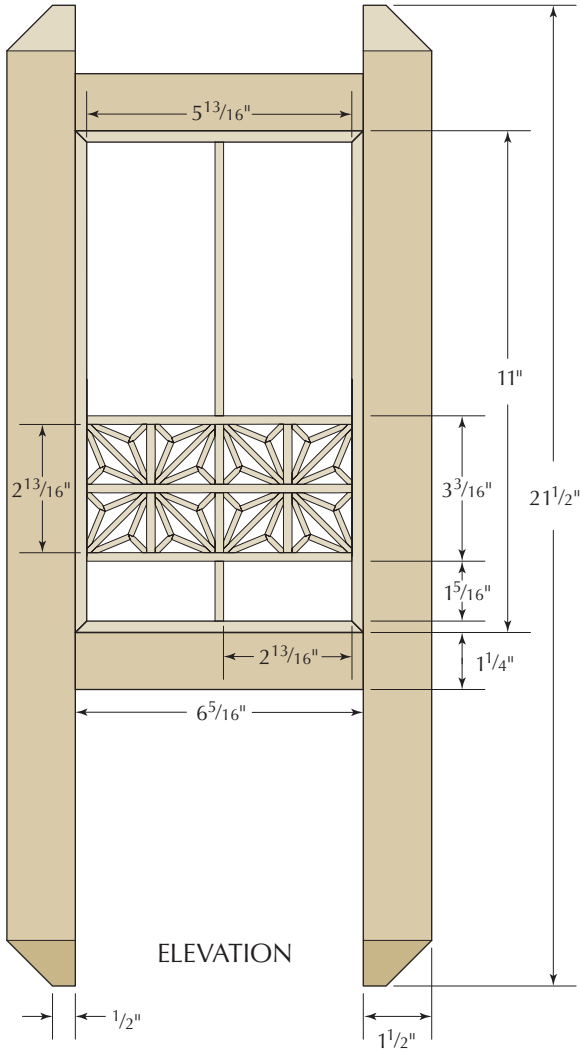
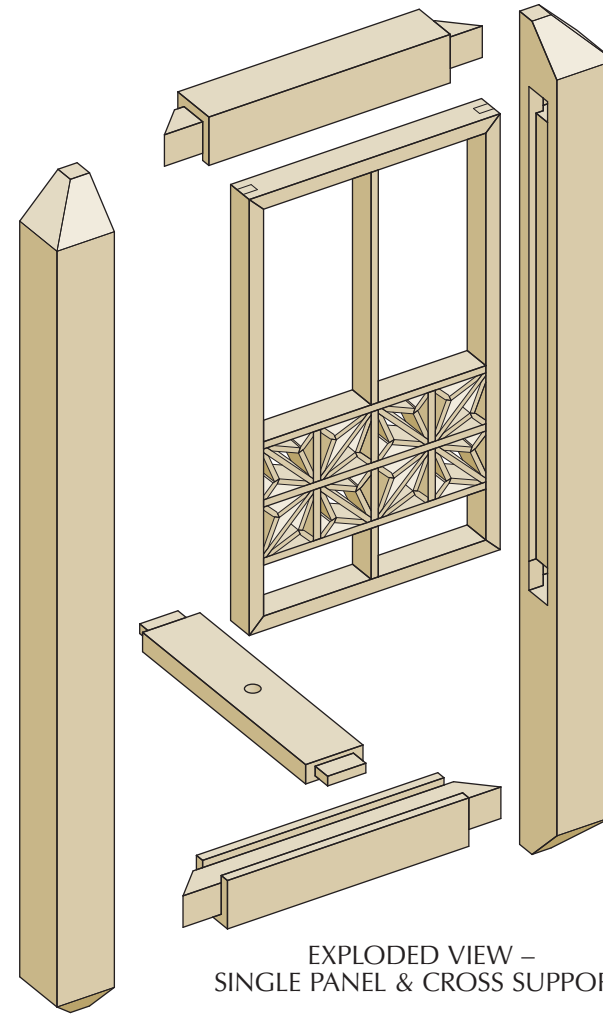


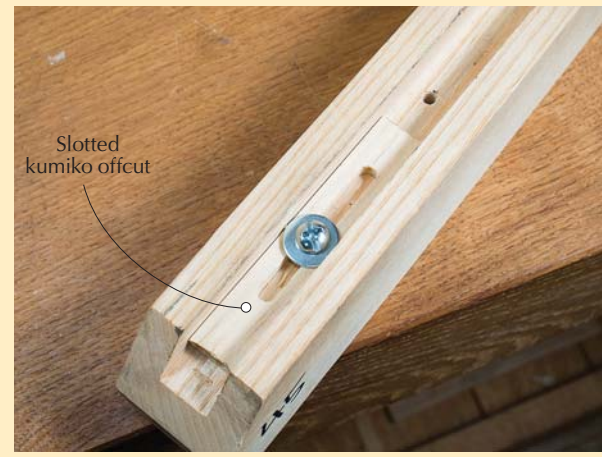
ELEVATION



EXPLODED VIEW –
SINGLE PANEL & CROSS SUPPORT

MITER JIGS

Miter jigs. *Nearly all the joinery and cutting of the kumiko happens in these two mitering jigs. Rip a groove about 3/4" wide x 1/2" deep in 8/4 stock. For this piece, 16" jigs will let you use both ends for different angles. You need, at minimum, one 90° end, one 45° end and one 22.5° end.*



Adjustable stop. *Take an offcut from a kumiko and cut a 5/16" slot in it for use as a stop in the jig. The stop needs to be about 4" long – you can drill several holes to mount it at different parts of the jig for different purposes. You can use pan-head wood screws, but I recommend drilling and tapping for 1/4"-20 machine screws instead.*

Mitered cheeks. *Rip cut at 45° for the tenon cheeks.*

Trim the shoulders. *A zero-set flush-cut saw rough-cuts the cheeks and removes the waste.*

Pare to fit. *Then pare the cheeks with a sharp paring chisel.*

interchangeable tracks (3/8", 3/16" and 1/8"), then tune them with a shoulder plane for exact consistency.

The tracks are mounted to a dead flat, quartersawn board, plus a few #6 wood screws that serve as stops. Thickness all the 3/8" kumiko strips, then change tracks for the other thicknesses.

The inner frame of the panel, called a "tsukeko," is made from the 3/8" kumiko. I cut the mitered-tenon joinery by hand with my thinnest dozuki, but a good dovetail saw will suffice. (The tenons are 1/4" x 1/8" x 1/8".)

For the mortised stiles, I follow the same process shown above but rip cutting at 90°.

Most of the joinery for the inner frame is done using purpose-made mitering jigs (see "Miter Jigs" on the previous page). Set the length with the fence piece, and the jig ensures exact consistency on all the pieces.

Lattice

Now on to the 3/16" inner latticework. On each frame, there are three horizontal pieces and a single central vertical, all joined by half-lap joints. The two additional vertical dividers are not full-length, and they'll be added once the frames are assembled.

Square cheeks. *Rip at 90° for the mortised stile cheeks.*

Cut the shoulders for the tenon centered on the end of all pieces. Pop the waste off with a chisel.

Lay out and cut the vertical piece by aligning the already-cut horizontal kumiko with its lower edge.

Next, use a pair of the middle pieces to mark the central half-lap on the remaining eight horizontals. Use the same middle pieces aligned with the bottom of the vertical lattices to mark them off; the spacing from the bottom is identical.

Finally, lay out the mortises in the outer frames using one of the vertical pieces and one of the outer horizontals. The mortises should be just more than

Kumiko Lamp

NO.	ITEM	DIMENSIONS (INCHES) T	W	L	MATERIAL	COMMENTS
OUTER FRAME						
❑ 4	Legs	1 1/2	1 1/2	21 1/2	Mahogany	
❑ 8	Rails	1 1/4	1 1/4	8 5/16	Mahogany	1" TBE*
❑ 1	Cross support	1/2	1 1/2	7 9/16	Mahogany	1/2" TBE*
KUMIKO PANELS, OUTER FRAMES						
❑ 8	Rails	3/8	3/4	6 9/16	Yellow cedar	
❑ 8	Stiles	3/8	3/4	11 1/4	Yellow cedar	
KUMIKO PANELS, GRID						
❑ 4	Long verticals	3/16	3/4	10 3/4	Yellow cedar	1/8" TBE*
❑ 8	Short verticals	3/16	3/4	2 13/16	Yellow cedar	
❑ 12	Horizontals	3/16	3/4	6 1/16	Yellow cedar	1/8" TBE*
KUMIKO PANELS, INSERTS						
❑ 32	Diagonals	1/8	3/4	1 7/8	Yellow cedar	
❑ 64	Hinged pieces	1/8	3/4	1 13/16	Yellow cedar	
❑ 64	Keys	1/8	3/4	5/8	Yellow cedar	

*TBE = Tenon both ends

Lay out and cut the vertical piece by aligning the already-cut horizontal kumiko with its lower edge.

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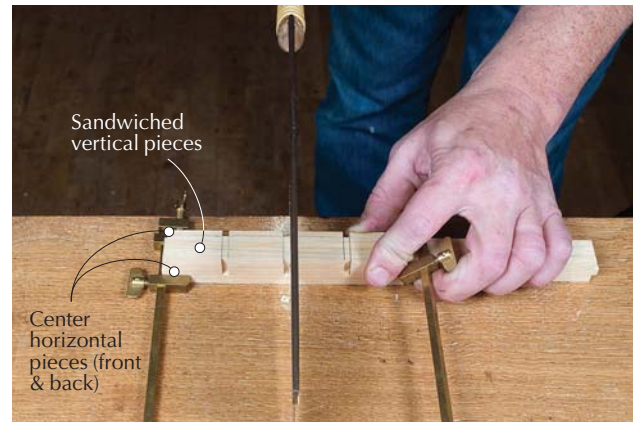
"Every man-made thing, be it a chair, a text, or a school, is thought made substance."

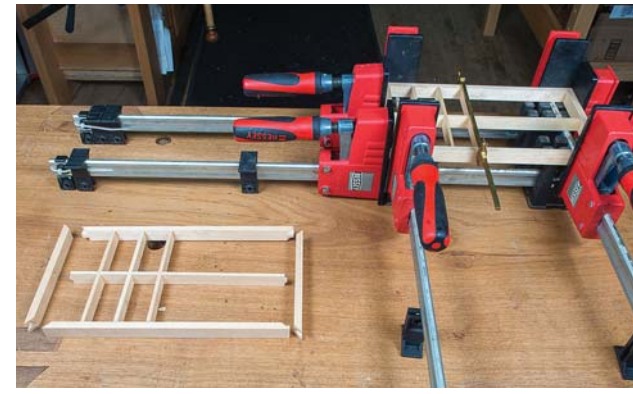
—Peter Korn (1951-), from "Why We Make Things and Why It Matters" (2013)

Gang-cut. *Mark and cut the central horizontal kumiko carefully; they will be the template for all the other lap joints (as shown at right) as well as for the frame's mortises.*



Half-lap lattice joints. *Start with the center horizontal pieces, which have three evenly spaced laps; you'll lay out the vertical laps from this piece to ensure consistency. Layout is simple if you've been precise – set a pair of dividers for 1½" and mark off three lengths from either side.*

Ready for assembly. *Here you can see the joinery on all the pieces that go together to form the inner structure.*



Clamp both ways. *While the glue cures, I work on the outer structure.*

1/8" in depth – the wood in the mortise tends to compress significantly, so be sure to remove enough material that spring-back won't force the pieces out of their mortises.

I don't usually glue the half-lap joints, which are tightly press-fit. I use a dab of glue in each mortise, and I glue the four corners as well. Though the frames are tight fits, I leave them in clamps for several hours to ensure a good bond.

Support Group

The outer frame is straightforward. The four legs are mortised to receive 3/4"-square, 1"-long tenons, and both the legs and the rails are grooved to house the kumiko panels. The rail tenons are mitered to prevent meeting. That reduces the glue surface, so pay attention to the fit of the mortises, particularly at the small inner edge.

One pair of bottom stiles gets centered 1/4"-thick x 1"-wide x 1/2"-deep mortises for a cross support that will house the lamp cord and threaded pipe. Cut the lamp support and fit its tenons, then drill dead center for the 3/8" threaded lamp pipe.

For the legs, mark the mortises and grooves for the kumiko frames, and cut the 3/16"-deep grooves with a router.

Then drill and chop the mortises, paying close attention to getting the long-grain faces square and smooth. Once done with the joinery, cut the large chamfered faces at the top and bottom of each leg. Pay close attention to the orientation of the pieces – only the outer faces of the leg are chamfered – and leave about 1/2" of flat area at both top and bottom.

Light 'em Up

The charred finish on the lantern's outer skeleton is done with a propane or MAPP torch. It's a lot like airbrushing, but with much hotter (and cooler) pig-

Stopped grooves. *I know of no good way to cut these grooves by hand, or I would. Routers were made for this.*

Final shaping. *Before lighting them on fire, finish-plane all the outer frame components and put a large chamfer on the long edges. I use a Japanese chamfering plane, which does a spectacular job of making consistent chamfers, but a block plane and some close attention does just as well.*

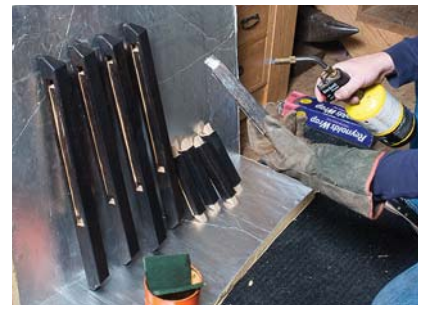
ment. Once the pieces are cool enough to touch, buff the wax with a lint-free cloth or finish with a few coats of padded shellac to enhance the depth.

Fill in the Blanks

By now the inner frames should be ready for the insert work. First, cut and install the two remaining 3/16" vertical kumiko in each panel. These should be cut to a length of 2 13/16", with a single, centered half-lap joint in each. This can be marked off with dividers just as the lattices were.

Some words about fitting: Even if you've been painstaking, there will be small variations in length of the pieces, so the miter shooting jigs you made for the tsukeko will be in constant use.

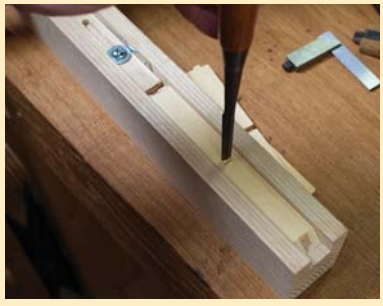
The best approach when fitting a set of pieces is to fit to the largest gap first, then systematically shorten the setting of the jig's fence with hammer taps to fit each joint in order of size.



Burnt is the new black. *I use a MAPP torch, held dead perpendicular to the surface, about 4"-5" away to char the wood. Once the color develops, while each piece is still warm, rub with burlap or a Scotch-Brite pad and paste wax to even out the color.*

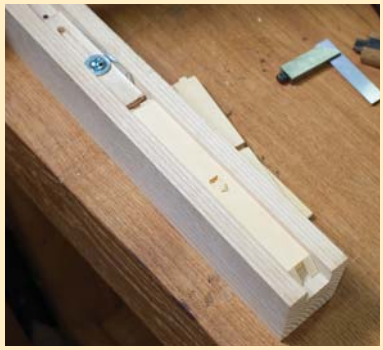
In this way, when you shoot a piece that is too large for any of the remaining openings, those few hammer taps will adjust the jig's fence length and allow you to re-shoot it for a perfect fit in the next-largest slot. Continue this process until you've finished all the installations.

CHOP MICRO-MORTISES

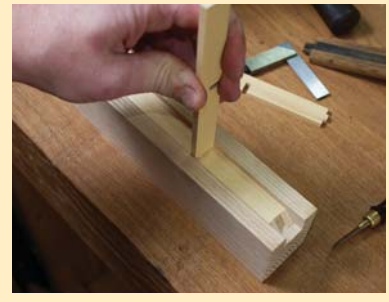


Tiny holes. *Cutting such small mortises requires more finesse than most mortising. A single sharp blow with a 1/4" chisel defines the longer edges and severs the end-grain fibers.*

Hide the evidence. *Use a 1/8" chisel to pop waste from top and bottom, so that any compression marks will be hidden by the kumiko shoulders when installed.*



The perfect pop. *Waste should pop out like a little spiritual biscuit.*



And insert. *Check your fit and repeat the initial steps as necessary. With practice, I can get to sufficient depth with a single "pass" of my chisels.*

Diagonal Fret Work

After installing the small vertical dividers, fit in the diagonals for each panel. Set the 45° jig fence to 1 7/8" (just a bit larger than necessary). It's important to shoot both faces of one end before flipping the piece end for end, or the length will not work out correctly. Check the fit. Hopefully it's just a bit too large for all the openings, so tap the fence on the jig and re-shoot one end.

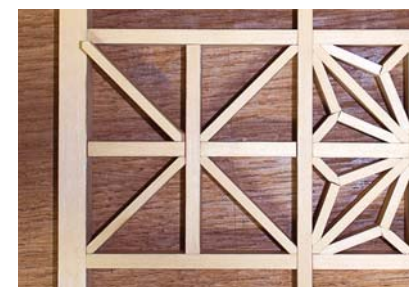
Continue until you have the piece fit to the largest opening, then shoot another piece to the same size and check its fit in all the remaining slots. If it fits any of them – great. Shoot another piece. Once a piece is too large for all the remaining openings, tap the fence closed a few thou and continue the process.

A Dash of Magic

While you might not realize it from looking at the opening photo, the outside-angled pieces of each quartered section are "hinged" – that is, the wood isn't cut all the way through where it bends.

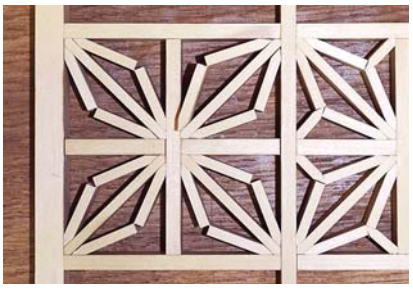
Sizing the "hinged" pieces is trial and error, but the same length as the diagonal in the last step is a good place to start. Cut and shoot a 1 7/8" kumiko strip as with the diagonals, but this time use the 22.5° shooting jig for an

Taking shape. *First install the short vertical dividers.*

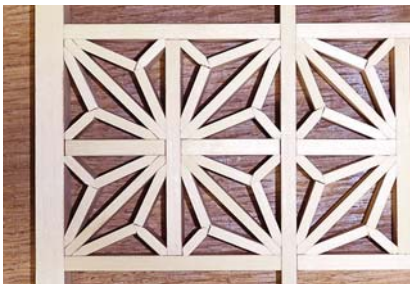


Diagonals in place. *Next, cut and install the diagonal inset pieces.*

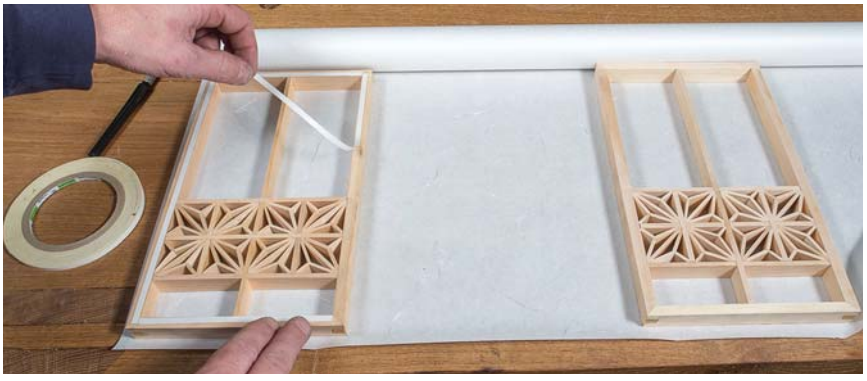
See & saw. *A utility lamp, shining into the work at bench level, makes it possible to gauge by eye the depth at which to stop sawing.*



Folded wood. *The "magic" hinges are a result of careful and controlled sawing.*



Keyed up*. Lock everything in place with the keys and take a deep breath.*



Stick 'em up. *Double-sided tape beats traditional rice glue on all counts.*

included angle on each end of 45°. Use a marking gauge to mark a crosscut line at dead center for sawing.

You're going to saw this piece almost all the way through, but stop just a few thousandths of an inch short to leave a hinge that allows the piece to be folded for installation. This sounds impossible, but it's actually not hard if you work smart. The simplest and best solution is to use a sharp raking light that will let you see how close the saw teeth are to the bottom.

A dab of water on the bottom of the piece will help the hinge pop open cleanly; it should fold with nearly no force and remain intact. Install the piece in one of the panels and check its size. When pressed firmly into the corners, each leg of the hinge should just about bisect the corners. If it is too long, start over with a slightly shorter hinge piece. A bad fit will look sloppy, so try to get a good length worked out. Cut all the hinge pieces to the same length and install them in the panels.

The Keys

And now for the final pieces: the keys that lock the hinges and make the pattern complete. Each key is quite small, and you'll have to do the same sort of large-to-small sizing as you did for the diagonals.

Start by crosscutting all the keys from 1/8" stock at 5/8", which should be oversized. Shoot both faces of one end on the 22.5° jig. Then shoot the opposite end on the 45° jig and check the fit, resetting the fence and re-shooting as required. The piece should just slide in place with light force, locking the entire pattern solidly in place. If there is any wiggle, the key is too small. Don't force a piece, though, because this will distort (or break) the lattice. Again, work from largest opening to the smallest.

Shoji Paper

The last step before assembly is to install paper on the inside of each panel. Traditionally, this was done with rice glue, but I find modern shoji tape simpler to install and repair. Put the tape around the perimeter of the tsukeko frame and remove the backing. With your shoji paper flat and face up on the bench, put the frame on the paper and press gently to adhere the paper. Trim the edges to the frame with an X-Acto blade.

To get the paper drum-taut, spritz it lightly from the rear with water. This will make the paper sag slightly, but once it dries (20 minutes) it will be tight and seamless.

Wrap it Up & Turn it On

The glue-up is best done in two stages. Glue the front and rear sections first, then install the lighting hardware in the cross support. I used a lamp kit from my local big box store. I recommend an inline cord switch over a socket-mounted one to keep from having to reach in to turn the switch.

Once the front and rear panels are dry, install the remaining panels and stiles, and do the final glue-up. After the glue dries, power up your new lamp and enjoy some good punk rock (loud, of course) and a beverage while you bask in the glow. **PWM**

Raney is an infill planemaker and woodworker at Daed Toolworks (daedtoolworks.com); his shop is located near Indianapolis, Ind.

ONLINE EXTRAS

For links to all online extras, go to:

- **popularwoodworking.com/apr15**

WEB SITE: *Visit the the Daed Toolworks web site to see Raney Nelson's infill planes and read his blog.*

TO BUY: *For more on Japanese latticework, the author recommends Desmond King's "Shoji and Kumiko Design: Book 1" and Toshio Odate's "Making Shoji."*

IN OUR STORE: *Make a simple "Shoji-Paper Lamp," an article by Christopher Schwarz.*

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Charred Finish

BY SETH GOULD

Fire and wax together produce a rich black surface.

Fire might not be the first finishing technique that most woodworkers gravitate toward; then again, I am not most woodworkers.

As a blacksmith and toolmaker, I am around fire every day, and when I began burning my hammer handles, I found it to be a simple way to obtain an alluring surface that set my work apart. It is unlike any other finish I have seen, and it really stands out on its own.

I don't claim any ownership over this application, because I am sure at some point I saw another blacksmith's handle done this way. But by now I have done it enough to feel comfortable sharing this technique.

Beyond the charred oak barrels used in distilling spirits and some use of fire finishing in Japanese architecture, I have been hard-pressed to find mainstream examples of burnt wood used as a finishing technique.

Tools. *A torch, some wax and an abrasive pad are all you need to produce a rich black finish.*

Results. *This hammer handle with a charred finish has one coat of wax that was added while the wood was warm and buffed with a rag once it cooled.*

Material Options

In my experience, open-grained hardwoods such as hickory, oak, walnut and mahogany produce the best results for this technique. With these, the softer earlywood tends to burn away faster, leaving a varied surface texture that looks and feels great after charring.

Woods with a more closed grain, such as maple and cherry, keep their smoother surface and don't turn out nearly as compelling. Softer woods such as pine and cypress tend to burn too quickly and have a ragged appearance.

Beyond the species, two factors to keep in mind are moisture content and thickness. If the wood is too wet or too thin, it is prone to warping or cracking. Any well-dried wood should be fine, but stay away from anything green.

I tend not to burn wood that is less than 5/8" thick. The smaller dimensions are unpredictable and especially prone to bending. One way to combat this is to use straight-grained wood to help prevent unwanted movement.

The Process

For a charred finish, you will need a piece of abrasive cleaning pad (such as Scotch-Brite), paste wax, a rag and some sort of flame. I use my acetylene soldering torch, but an inexpensive propane torch or MAAP torch will work just fine.

The beauty of the technique is that the wood can be surfaced to a rather rough state, and, through the process of burning, the end result is a refined surface. I usually don't go beyond a fine

ALL PHOTOS BY THE AUTHOR EXCEPT "IN FURNITURE" IMAGE, COURTESY OF TOM SHIELDS

Hot surfaces. *This side-by-side comparison shows show how much the charring technique refines the surface of the wood; there's no need to sand before burning.*

In motion. *Use the torch to char the wood evenly, constantly moving so you don't burn away too much material in one spot.*

Wax on. *Use a liberal amount of wax; the wood really soaks it up once it liquefies.*

> "Keep a little fire burning; however small, however hidden."
>
> —Cormac McCarthy (1933-), American author

Fast finish. *With about 30 seconds of scouring, you can skip an hour of sanding.*

rasp for my shaping and finishing; the torch takes care of the rest.

When putting the flame to the wood, don't be too aggressive at first. I approach the wood with the torch and move up and down the material so I am not lingering on any one place with the heat. By constantly moving the flame, the wood will burn evenly and be less prone to bending, warping or cracking. Also, if you stay in one spot, you run the risk of burning away too much material and creating a depression.

If the wood flares up, I simply blow it out and continue burning. I keep going over the piece until I can no longer see the color of the wood and there is an even black char on all the surfaces.

For some applications, however, partial burning can be an attractive alternative as well. Experiment!

Next, use your Scotch-Brite pad to scoop up some paste wax and aggressively rub it into the wood. This works best while the wood is still warm so the wax melts and spreads around.

As you scrub, the charred particles will be picked up by the liquid wax and help to blend any unevenness. Once you have given the piece a good scouring, wipe off the excess wax and let it cool.

At this point, if you see any spots that seem light or uneven, you can go back and burn a little more. This will burn off any wax you have already applied, so you will have to reapply where necessary.

When the piece cools, you can add more wax to build up the finish, but I usually just buff with a rag and call it a day.

For me, this technique is purely aesthetic, so my experimentation has been rather limited. There are many places this finish could be used, though—such as woodworker Tom Shields does on his contemporary work.

For another charred finish example, see "Kumiko Lamp" on page 33 in this issue. **PWM**

In furniture. *Tom Shields, who has work in many museum collections, is a fine example of a contemporary furniture maker who uses the charred finish technique in his work.*

Seth is a metalsmith who lives in Cleveland, Ohio. His work has appeared in numerous exhibitions and publications, and he regularly lectures on his craft.

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WEB SITE: *See more of Tom Shields' work at tomshieldsart.com.*

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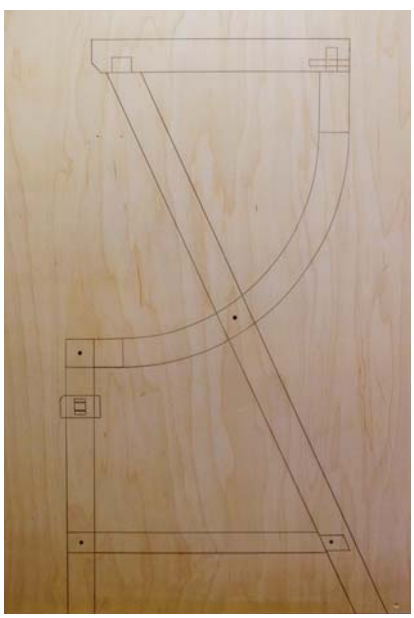
Curve Appeal

BY NEIL CRONK

This stool builds your skills with eight different joints and bent laminations.

Competition is the whetstone of talent; this was in full effect when I built this Wharton Esherick-inspired stool for an online shop stool build-off hosted by Flair Woodworks. It was the perfect opportunity to try out a design that had been floating around in my head for a few months – and I won, so I count it as a success.

The stool provides an exercise in bent laminations and eight different joints: angled mortise-and tenons, both straight and angled drawbored mortise-and-tenons, a pegged slip joint, several different types of lap joints, dovetails and wedged through-tenons. Broken down step-by-step, this project is remarkably simple to build – even if you're new to the techniques.



Drawing. *A full-scale drawing helped me work out the joinery, but it also serves as a template for the final design.*

I fiddled with the design by drawing the stool's profile full-scale on some scrap plywood, playing with the proportions of components and joinery for each connection until I was satisfied. Then, I used the full-scale drawing as a template for the parts, and as I laid out some of the joinery.

I also made a plywood full-scale drawing of the bottom to use as a layout template, and a router jig to locate the handhold on the underside of the seat.

White oak was my choice for this project because it bends easily, so I knew it would work for the bent laminations on the legs. Also, I just like working with white oak.

Start at the Top

Start by laying out the parts on an 8"-wide x 8' long 8/4 chunk of white oak and rough-cut all but the leg stock. For the legs, select one full-width piece of stock that's at least 28 3/16" long (try to find a piece with a rift-sawn edge for the curved laminations). Working with an uncut piece makes it easier and safer to joint then cut the bent-lamination plies on the band saw.

The seat is 11" wide, so if you don't have a board wide enough you'll have to glue up two pieces; try to slip-match them to provide the illusion of a single piece. Clamp and set that glue-up aside to dry while you work on the curved portion of the legs.

With the leg material planed to 1 1/2" thick, draw carpenters' triangles on the face so you can get the plies back in the same order after milling them.

Rip 1/8"-thick strips off the edge, jointing between each cut.

Cut 13 strips for each leg, then plane them to 3/32" to make up the 1 1/4"-thick bent laminations. The remaining wood is the stock for both of the straight legs.

For lamination glue-ups, I've used both Old Brown Glue (liquid hide glue) and polyurethane Gorilla Glue. Both work well and have rigid glue lines, though I had a bit more squeeze-out to clean up with the Gorilla. I know many woodworkers prefer plastic resin glue for laminations because there's no creep, but I didn't have any on hand. (See "Bent Lamination Form" for how

BENT LAMINATION FORM

For my bent lamination work, I build a form with the required radius (in this case, 8 7/16") out of three layers of 3/4" plywood. For this form, the final length and width is approximately 15 x 11 1/2" – those dimensions needn't be exact; you simply need to be able to fit the clamps.

First, lay out the radius on the corner of a squared-up piece of plywood then "Price is Right" the line by cutting as close to it as you can without going over (I use a band saw, but a jigsaw works, too). Clamp the plywood into a vise and use a spokeshave to fair the curve to your layout line.

Clamp holes. *After gluing up the bending form, use a Forstner bit to drill 1 1/4" holes for the clamp heads.*

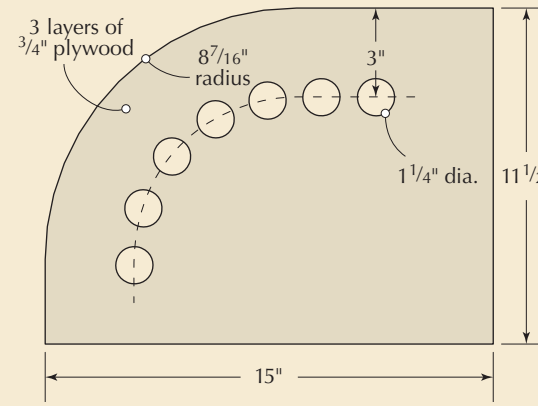
Trace the curve onto another piece of plywood, then cut close to that line and glue and screw it to the first piece, leaving a small amount overhanging the edges.

Use a pattern bit in a handheld router to match it to the first piece, then repeat this step once more to get to three layers in total.

Set a combination square to 3" and draw a line in from the edge, then drill 1 1/4" holes centered on that line for the clamp heads.

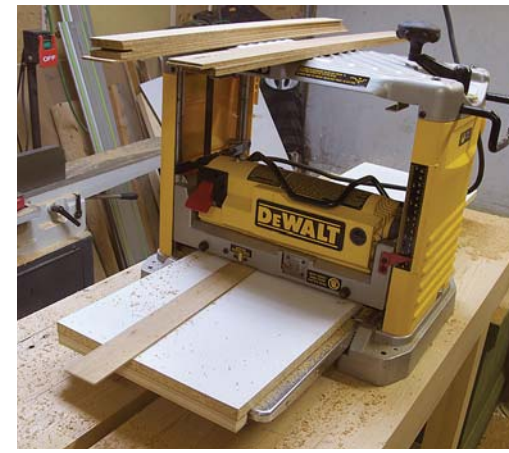
Cut six 2 1/4"-wide strips of 1/8"-thick Baltic birch plywood to act as clamping cauls.

— NC



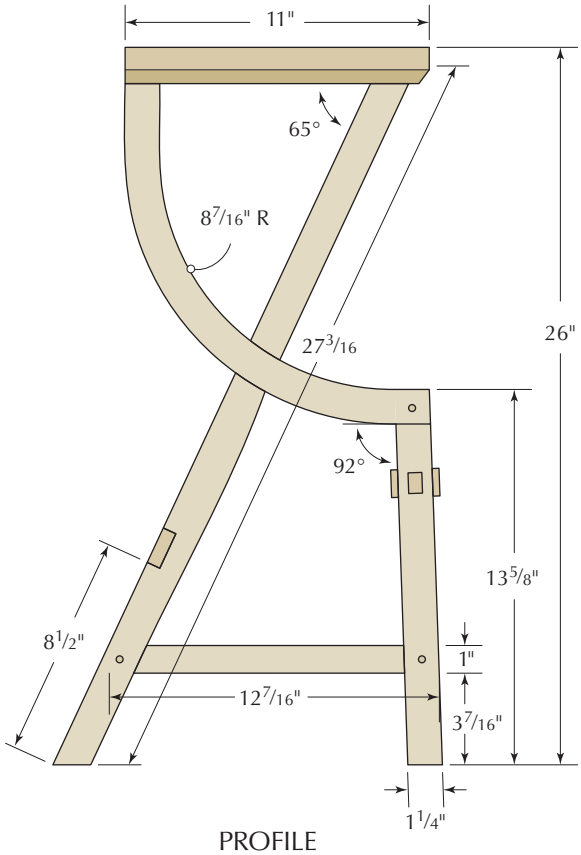
FORM PLAN

Lamination plys. *I use the band saw to rip 26 1/8"-thick strips for the bent lams. The remaining stock is for the straight legs.*

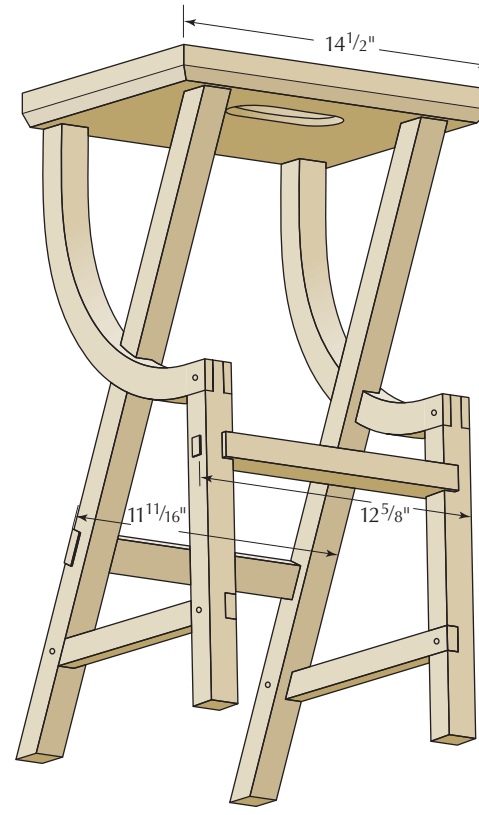


Now plane. *If, like mine, your planer has a minimum depth of 1/8", add a melamine or smooth plywood subbase to get to the required 3/32" thickness.*

PHOTOS BY THE AUTHOR; ILLUSTRATIONS BY DONNA R. HILL



PROFILE



3D VIEW

I construct a jig for this process – and you'll need two forms, or time for two sessions of lamination bending.)

If you're using polyurethane glue, spritz water onto both sides of the plies (not necessary with hide glue or plastic resin) then spread the glue on, stacking the plies together one at a time. With the triangles lined up, wrap masking tape around one end to make it easier to align the plies as you start adding the clamps.

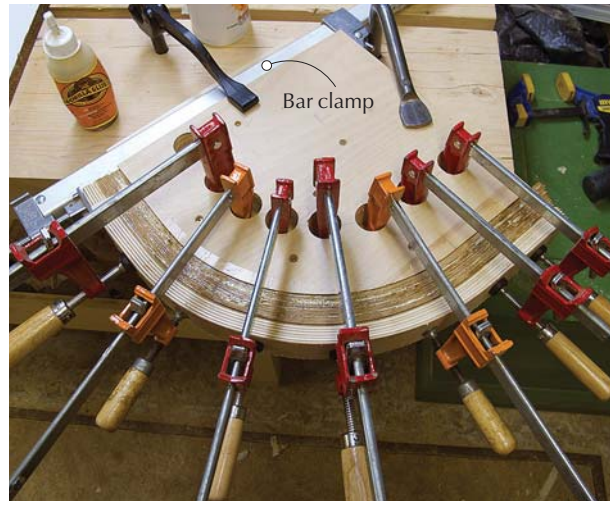
Start with a big bar clamp at the end that will have the bridle joint, then work your way out from there with F-style clamps. Use your hip to push the plies toward the form as you add and tighten each clamp.

Seat Mortises & Tenons

With the seat milled to final size, lay out the four mortises on the underside. The two at the back are 1/2" thick x 1" wide, located 1/2" from the back edge and 1 1/8" from the sides; they get cut to a 1" depth. The two at the front are 7/8" thick x 1" wide, located 7/8" in from the front and 1 5/8" in from the sides; they get cut to a depth of 5/8".

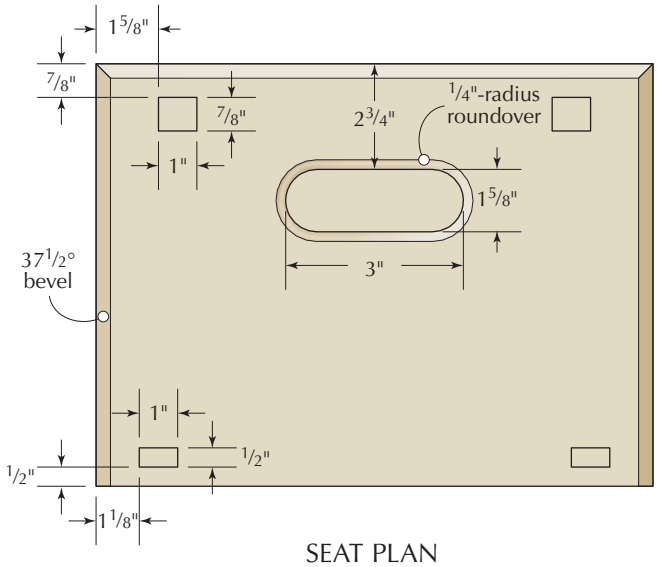
Remove most of the mortise waste with a Forstner bit at the drill press.

With the same setup, cut through-mortises on one edge of the plywood

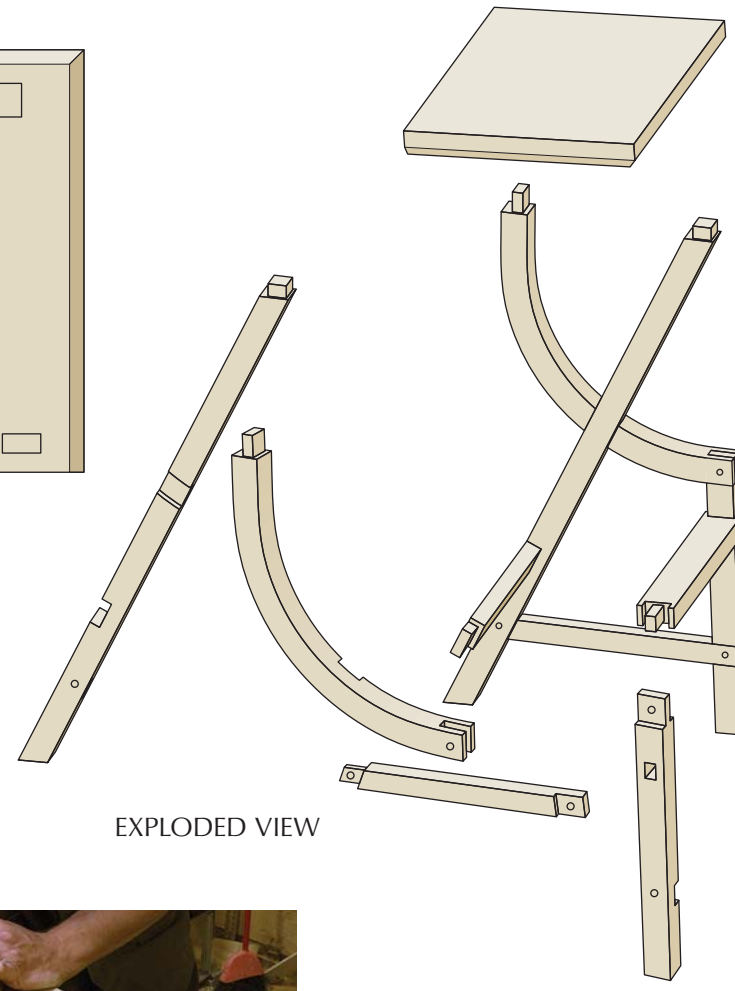


Work around. *The first clamp to apply is the bar clamp across the end; then work around the form using F-style clamps to pull everything tight.*

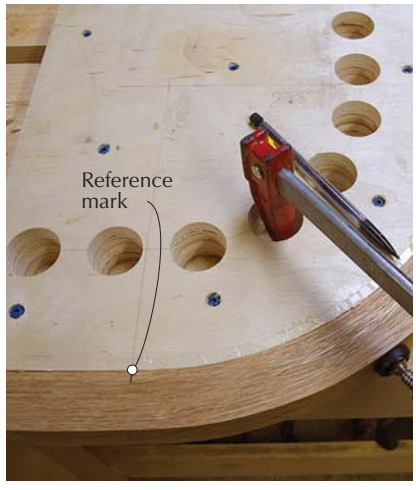
Waste away. *A Forstner bit makes quick work of removing the bulk of the mortise waste on the underside of the top.*



SEAT PLAN



EXPLODED VIEW



Reference mark. *Before you take off the clamps, make a pencil mark where the flat starts.*

Cleanup. *A small block plane makes quick work of cleaning off glue squeeze-out.*

seat template, widening the one for the straight legs (at the front) to 3 1/2". That way, you can use the same holes to lay out the half-lap locations for both the right and left leg intersections. (See the jig in use on page 48.)

Use a bench chisel to clean up the corners for the four mortises in the seat bottom and double-check to make sure they're the correct depth.

Clean up the drilled mortise corners on your seat template, too.

Now mill the pair of straight legs to 1 1/4" square. Cut both ends to 25°, leaving an extra 1" at the bottom to allow for leveling the stool after glue-up.

Before fully removing the clamps from the laminations (wait at least 24 hours), mark the edge where the flats start so you can easily match up the pair.

Now transfer the marks from the edge to the inside faces so you don't lose them when the edges are jointed.

I use a block plane to clean up the foamy squeeze-out from the Gorilla Glue before jointing the edge with my power jointer.

Now edge-joint the bent laminations. Make sure the convex side is riding flat against the fence and confirm that the edges are square before planing them to a final thickness of 1 1/4".

Line up the marks indicating the starts of the flats on the bent laminations, then clamp and screw the ends together in the offcut area.

As is to be expected, I had a small amount of spring-back when I pulled the bent legs out of the clamps. To fix

> "It is far better to work with one plane, one saw, one chisel and a few accessories, all of them good, honest steel, properly sharpened, than it is to have a cellar full of inadequate devices."
>
> — *"How to Work With Tools and Wood," Stanley Tools (1942)*

Joint. *With the outside edge riding on the fence, joint the laminated glue-ups to 1¼" thick. Make sure the pieces are square.*

this, I simply used a block plane and spokeshave to remove a small amount of material where the front stub leg attaches, bringing the piece back into line with my template.

With everything squared up, place the curved bits on the full-scale drawing and, with a marking knife, mark the locations of the ½"-thick x 1"-wide seat-tenon shoulders. Use a square to help carry the marks around both parts.

For the female part of the bridle joint, knife in the shoulder of the joint on the bottom outside joinery surface, then use

Small adjustments. *With only minor spring-back at the joinery surface, it was an easy call to remove a small amount of material to flatten the joinery surface. Such minor adjustments are invisible in the finished piece.*

a bevel gauge set to 2° to lightly transfer that up the sides; use a square to mark the shoulder on the inside face of the curve. I use a pencil to mark the ends of the part, again wrapping around the pair.

I cut the bent laminations to length using a handsaw with the help of a bench hook, holdfast and clamp. Before cutting, wrap some tape around them to hold the pair together after the screwed ends are cut free.

With the bent laminations and straight legs cut to size, and the tenon shoulders laid out, lay out the tenon cheeks on the top of the bent lamination. I find it hard to see gauge lines on white oak, so sometimes I put some green tape on the end grain before layout. When I gauge the lines, it cuts the tape; that makes the cutline easy to see.

For the straight-leg layout, use the full-scale drawing to locate and mark the tenon shoulders using a square and a bevel gauge set to 25° to wrap the line around. Show the legs to their seat mortises to mark out the cheeks. I use a square and marking knife to mark those lines from the end to the shoulder line.

I cut these with a handsaw then fit them to their mortises.

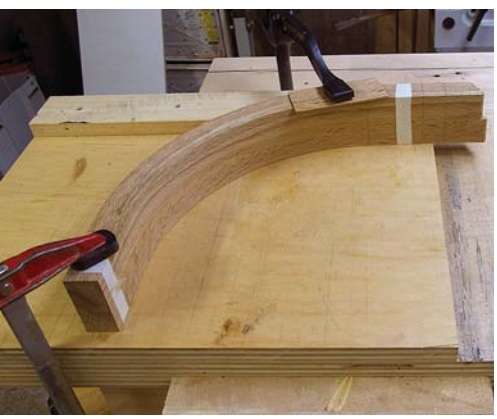
Join Stub Legs to Curved Legs

With the stub legs milled to 1¼" square x 14⅝" long (that includes an extra 1" for leveling), use a marking gauge set to the thickness of the curved legs (1¼") to mark the square shoulder for the bridle joint on the backside of the stub legs.

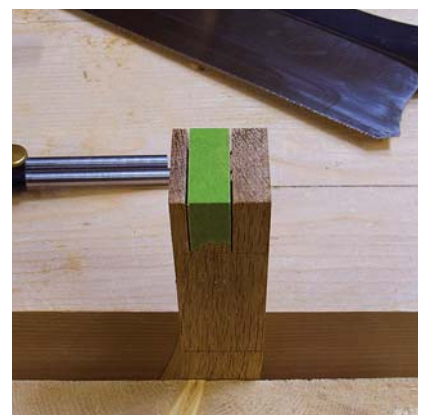
Set your bevel gauge to knife in the angled shoulders of the male portion of the bridle joint, then square across the front.

To lay out a bridle joint, I like to use a dual-wheel marking gauge with both cutters set to the same measurement. With one bevel facing in and one bevel facing out, I can use it to lay out both the male and female parts of the joint with the same gauge. Use the stem with the cutter's bevel facing the gauge's head to lay out the male portion of the joint. Use the other stem to lay out the female portion of the joint. This gauge set-up will ensure accurate knife lines.

Lay out the cheeks using the gauge set to ⅜" – leaving ½" in the middle – then cut to those lines on the band saw or with a rip saw, depending on your preference. I cut the shoulders with a crosscut saw and used a coping saw to



Taped up. *Tape helps to hold the bent laminations together as you cut them to length.*



Cheeky*. Colored tape helps me see and cut to my knife lines.*

Straight-leg tenon. *Use the full-scale drawing to locate the layout for the tenons atop the straight legs.*

'Curve Appeal' Stool

NO.	ITEM	DIMENSIONS (INCHES) T	W	L	MATERIAL	COMMENTS
❑ 1	Seat	1 5/16	11	14 1/2	White oak	Bevel sides and front
❑ 2	Long legs	1 1/4	1 1/4	28 3/16*	White oak	Tenon one end
❑ 2	Curved legs	1 1/4**	1 1/4	21 5/16	White oak	Tenon one end
❑ 2	Stub legs	1 1/4	1 1/4	14 5/8*	White oak	
❑ 2	Side stretchers	3/4	1	12 7/16	White oak	
❑ 1	Rear stretcher	3/4	1 3/8	11 11/16	White oak	Dovetail both ends
❑ 1	Foot rest	1	1 3/4	12 5/8	White oak	Tenon both ends

*Includes extra for leveling **Final size; start with 2 1/2" or thicker stock to account for lamination saw kerfs

Dual cutters. *Set both blades to the same measurement and use one gauge for the mating parts to ensure accurate lines.*

remove the middle waste. Clean up to the lines with a chisel.

To glue up this joint, make a curved block screwed and glued to a 1/8" plywood caul with the end cut square and in line with the joint. With a couple of notched cauls, glue up the joints with liquid hide glue. When the glue is dry, drill a 1/4" hole in the center of the joints, then pin them with a riven oak dowel.

Dovetailed Stretcher

For the dovetailed rear stretcher, cut a 1/4" deep rabbet, 1 5/16" from the end of the stretcher. This makes it easy to register the stretcher to the leg as you mark the baseline for the second tail. Plus, it reduces the thickness of the tail, so its socket is 1/2" deep to maintain the legs' structural integrity.

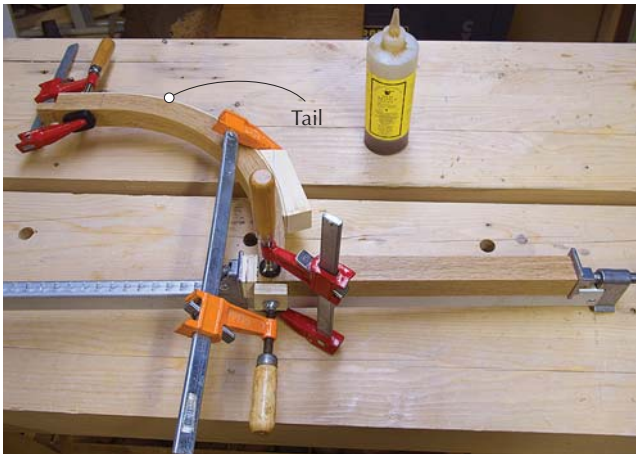
Then, with the straight legs in their seat mortises, butt the rabbeted shoulder of the stretcher against its leg and mark the other shoulder with a knife.

Mark that shoulder and again cut a rabbet. Now lay out and cut the dovetail pins (I like a 10° slope). Locate the stretcher at its final location across the straight legs, then scribe the sockets and mark the baselines on the legs.

Remove the stretcher, cut the edges of the socket and add a few more kerfs in the waste to make it easier to chisel the waste out. After removing the bulk of the waste with a chisel, clean up to the baseline with a router plane. Fit the joint, but don't glue it up just yet.

Leg Half-lap Joints

Using the plywood seat template, place the bent-lamination tenon into the tight-fitting mortise and place the straight leg into the slotted mortise, making sure the shoulders are tight.



Bridle joint glueup. *A curved caul with a "tail" that registers along the length of the curve will help you clamp this joint together as the glue sets.*

Place a clamp across where they meet. Lightly mark out the shoulders of the half-laps, then extend the lines down the edges and use a marking gauge set to 3/8" to mark the baselines.

I use a wide chisel to deepen and notch the straight shoulders on the curved legs; that creates a shoulder that serves as a guide for a perfect saw cut. On the straight legs, remove the bulk of the waste and pare with a small

Mark the stretcher. *A rabbeted shoulder on one end makes it easy to register the stretcher against the leg as you mark the shoulder location at the other end.*

Sockets. *Place the stretcher in its final location, then use a clamp across the legs to pull them tight to the rabbeted shoulders. Mark the dovetail sockets on the legs.*

Lap layout. *With the legs registered in the seat layout jig, clamp across where they meet, then mark the shoulder locations on each piece for the half-lap joint.*

Half-lap waste. *After cutting a series of kerfs with a handsaw, I use a chisel to remove the bulk of the half-lap waste. A router plane cleans things up for final fitting.*

chisel to establish the curved shoulder. Use a router plane to clean up the floor on both halves.

Footrest: Wedged Tenons

To lay out the through-mortises for the footrest's wedged tenons, align the stub-leg tops and clamp them together.

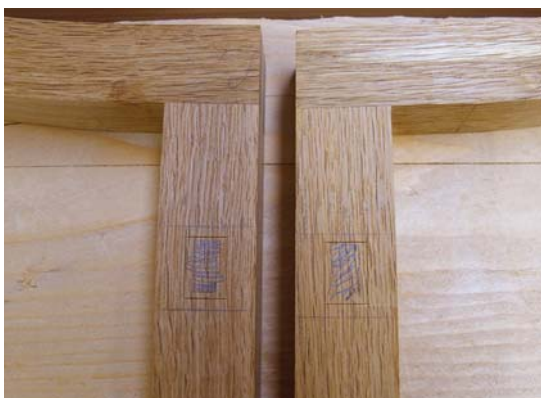
Now mark 3/4"-long x 1/2"-wide through-mortises, 2 7/8" down from the top of the stub legs. I mark them on one face, then lightly wrap the lines around to the opposite face to ensure they align.

Using a drill press and Forstner bit, remove the bulk of the waste coming from both sides, then clean up the corners with a chisel. Though this is a wedged mortise, I cut and fit everything straight, then flare the mortise.

The footrest has one through-tenon that will be wedged and two ears that wrap around the front and back of the leg; I call it a "triple tenon" (only the center portion is integral to the joint).

To make it, cut the center tenon 1/2" wide, then cut the shoulders of the short ears. Cut the center tenon to final thickness with a handsaw, then fit it with a router plane as necessary. Slide the tenon into the mortise and mark the outside cheeks, then cut them with a handsaw. Remove the middle waste with a coping saw and chisel.

When wedging a tenon, I saw the tenon kerfs, insert the wedges, then measure the tenon width so I know how much to flare its mortise (in this case, 1/8"). Lay out the extents of the flare, then cut the slopes with a chisel.



Through-mortise layout. *Here's the marked layout for the footrest's mortises.*

Measured flare. *Insert the wedges into the unseated mortise, then measure the flare. Use a chisel to pare the mortise*

Guided paring. *A block cut to the desired angle (in this case, 25°) helps guide your chisel for perfect paring.*

Drawbored Side Stretchers

The side stretchers are installed with angled mortise-and-tenon joints that

Eased corners. *The "ears" of the footrest's front get rounded with a rasp and files.*

are drawbored into the straight legs and attached with a drawbored lap joint to the front stub legs.

Lay out the 3/8"-thick x 3/4"-wide x 1"-deep mortise, 1/4" in from the outside edge of the long straight legs. Hog out the angled mortises at the drill press, then use a purpose-made ramp to guide your chisel as you pare the 25° slopes.

Lay out the tenons to match and cut them. I cut the shoulders and cheeks with handsaws and tweak them as needed with a router plane.

This joint gets drawbored, so with a piece of scrap in the mortise (to help limit the depth), drill a centered 1/4" hole, 3/8" in from the edge.

To mark the drawbore, insert the matching tenon and, with the shoulders tight, use a 1/4" drill bit to mark the center of the hole.

Remove the tenon and offset the hole center 1/16" toward the shoulder, then drill.

Re-insert the rear tenon and pull it in place with a drawbore pin, then mark and cut the lap-joint layout on the front leg and stretcher. Drill 1/4" drawbore holes for the half-lap, too.

Shapely Seat & Footrest

Now you're ready to excavate the handle on the bottom of the seat, bevel its underside edges and shape the footrest.

Make a handle template out of 3/4" plywood by drilling two 1 5/8" holes 3" apart, 2 3/4" in from the edge. Cut the flats between them with a jigsaw and clean them up with a rasp. Attach a piece of 3/4" plywood to serve as a fence, then center the template on the seat and clamp it in place. Rout the waste with a template bit to a depth of 5/8". I used a 1/4" radius bit to round over the edges.

Get a handle on it. *A router template makes it quick and easy to cut a handle on the underside of the seat.*

Take it in stages. *Glue up is best done in a well thought-out order, and in stages.*

To lighten the seat, cut a bevel on the bottom of the front and both sides. I set my table saw to 37 1/2°, and, starting with the end grain sides, made the cuts. Clean up the tool marks with a block plane.

With a block plane, rasp and file, round over the front edges of the footrest and chamfer the back edges.

All Together Now

Before gluing up, make sure all surfaces have been smoothed with a handplane, spokeshave or card scraper (or sandpaper, if that's your preference).

As with most projects, this one is glued up in stages, with ample drying time between each.

With the legs in position on the seat to keep things properly aligned, glue up the wedged through-mortise footrest on the front legs, and the rear drawbored mortise-and-tenon joint of the side stretchers to the back legs. After the glue is dry, flush and clean up the joints as needed.

Next, glue up the leg half-lap joints, the front drawbored lap joint on the side stretchers and the dovetailed rear stretcher. (Again, after the glue dries flush and clean up the joints as needed.)

Finally, glue the legs into the seat bottom, using angled cauls to seat the clamps at the front and pull that joint tight (see photo at left). Drawbore the tenon atop the curved leg through the back edge of the seat; no clamps are needed there.

Before finishing, the stool needs to be leveled. To do this, I place it on my bench (a known level surface) and insert wedges under the legs as necessary until the stool is level to the bench.

Then, using a block of wood that's just thicker than the wedges, set a pencil on that block, and mark around the bottom of each. Cut to the lines with a crosscut saw. (You might also wish to lightly chamfer the edges of the legs to keep them from splintering at the bottom corners as the stool gets dragged across a floor.)

Before applying a finish, break all the edges with #220-grit sandpaper and clean up any remaining tool marks or marks from the clamps. Also cast a close eye over the piece to look for any glue squeeze-out; clean up with sandpaper or scrapers as necessary.

To finish the piece, I applied a washcoat of one-pound-cut shellac, followed by two coats of polymerized tung oil (with ample drying time between coats) that I applied by wet-sanding with #600-grit wet/dry sandpaper for a smooth finish. PWM

Neil is a woodworker, toolmaker and furniture designer in Dartmouth, Nova Scotia. You can see more of his work at cronkwrightwoodshop.com.

ONLINE EXTRAS

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Built in Baltimore. *While many people associate Jennie Alexander's chairs with country woodcraft, she lives in urban Baltimore, where she developed the design for her chair.*

Make a *Revolution* from a *Tree*

BY CHRISTOPHER SCHWARZ

A curious attorney helped kick-start 'green woodworking' with a single chair and a book.

Of all the unusual twists and turns in the life of Jennie (formerly John) Alexander, surely the most incredible has been to be pronounced dead in the media while being very much alive.

When her second woodworking book was released, "Make a Joint Stool from a Tree" (Lost Art Press), some reviewers said she was deceased; others assumed "Jennie" was John's widow.

So let's set that fact aside – John is now Jennie – because it has nothing to do with Alexander's incredible woodworking career, the iconic chair she designed or her profound influence on woodworking during the last 37 years.

Alexander's first book, "Make a Chair from a Tree" (Taunton Press and later Astragal Press), was the 1978 lightning bolt that ignited the woodworking passions of thousands of woodworkers and brought "green woodworking"

PHOTOS BY THE AUTHOR EXCEPT WHERE NOTED

out of the forest and into the modern workshop. Even after the book went out of print, the chair continued to inspire through a DVD of the same name published by ALP Productions.

The chair that is featured in the book and DVD is both old and new. While it is based on traditional ladderbacks and deep-lignin science, Alexander's chair is not tied to a particular period or style. Its parts are shaved instead of turned. It looks at home in a log cabin or an urban loft. It weighs almost nothing but is as strong as a suspension bridge. And it is definitely the most comfortable all-wood chair I have ever sat in.

There is something about the back that is simply incredible. The two slats hit you in the right place, and the back legs are curved in a way that pleases your eye and your muscular system.

As soon as I sat in one of her chairs, I knew I had to make one.

I'm not alone. Thousands of chairmakers have been smitten with the design. And many of them, such as chairmaker Brian Boggs, went on to become professionals. So if you are one of the tens of thousands of people who now build chairs from green wood or carve spoons or bowls, you are almost certainly part of the lineage that began – in part – with a Baltimore boy who was handy around the house.

Obey Snowball

Born in December 1930, Alexander was the son of a mother who was a secretary to the president of an insurance company. She would leave a to-do list for Alexander to tackle after coming home at night. She arranged for Boulevard Hardware to provide tools from the store's extensive stock of Stanley tools. Jerry and Miss Irma at Boulevard filled the bill.

The owner also gave Alexander handouts on tool use that were printed by Stanley Tools, which Alexander kept in a three-ring binder, including a guide to sharpening and using hand tools.

"That," she says, "was my bible."

Another important part of the home picture was that Alexander's mother, a former Sloyd student in Massachusetts, had collected some old furniture, including a post-and-rung chair with a fiber seat. "It had always been there," Alexander says about the chair. "I liked that chair. It was comfortable, low and stocky but had an elevated air to it."

Broken chairs. *Alexander's research has been informed by many bits of research, including looking at bits of chairs that have broken to learn why they failed.*

Alexander attended Baltimore City Polytechnic Institute, a four-year high school that specialized in engineering – graduating there would give her a year's head start at university. In high school she studied engineering with extensive shop work, from combustion to electricity to woodworking – things that stuck in her scientific mind and would come in handy later on when bending chair parts with heat and moisture.

After graduating, Alexander enrolled at Johns Hopkins University as a sophomore to study engineering. But she was shocked to learn the school was teaching the same material from high school, but to four decimal points of precision instead of two.

"I was bored," she says. "I was interested in music."

She founded a repertory jazz trio and played around Baltimore, playing piano in bars instead of studying. She left Johns Hopkins and went to night school to study mathematics. Then she quit that, got a job as a draughtsman and then at a war plant – all while singing and playing jazz piano with the Southland Trio.

But one morning, Alexander was lying in bed unable to sleep and heard a voice from her childhood speaking to her. It was the voice of Snowball, a voice on the radio show "Uncle Bill and Snowball," which featured a blind banjo player who would sing in the high falsetto voice of Snowball.

"Go to law school," Snowball said. Alexander took the disembodied advice and by 3:15 that afternoon had enrolled in law school at the University of Maryland at Baltimore.

Alexander graduated law school in four years instead of three because she decided to attend night classes to prevent her from playing jazz on weeknights. After coming in first on the bar exam, Alexander married "a wonderful girl" named Joyce, now deceased, and started a traditional law career. Which might have been the end of the story if it weren't for meeting Charles Hummel at Delaware's Winterthur Museum.

Shaker Chairs

Like many young people, Alexander and Joyce fixed up an old house; Alexander started reading English books on traditional trade, including chairmak-

Almost homemade. *Alexander enjoys making effective tools from inexpensive raw materials. Here, she made a useful side hatchet from a standard double-bevel hatchet.*

Boring the joints. *Alexander demonstrates boring the mortises in a leg using a benchtop fixture that simplifies the process.*

'Make a Chair' on a chair. *Alexander's first book – "Make a Chair from a Tree" – sitting on a chair made by Larry Barrett, one of Alexander's many students.*

ing. She fixed up a fishing boat (which later became a pond for storing wet wood for chairmaking), started making stools and decided to make some chairs.

"I called a firewood man and said I want a hickory log so long and so straight," Alexander says. Later on, "I hear a great sound at the back. He's dropping off hickory logs. Don't ask me how I broke those down to get them on the lathe. But it's time to make a chair. I got those legs up on the lathe, and the lathe was jumping across the room.

"When the rough, split spindle finally turned round, 6'-long sopping-wet strands of hickory traveled up the gouge and hung themselves up on my right ear. I said, 'I will never go to the lumberyard again.'"

And she never has.

Alexander and Joyce were fascinated by the Shakers. They made several trips to the Sabbathday Lake Shaker community in New Gloucester, Maine, where Sister Mildred there became Joyce's "spiritual guide." Alexander decided to make a Shaker chair with a one-slat back.

"So I made some very clunky Shaker chairs with one slat and we used fake twisted paper (instead of rush or tape for the woven seat)," she says.

In the meantime, Alexander joined the Early American Industries Association (EAIA) and met Charles Hummel, author of the book "With Hammer in Hand" (University Press of Virginia) and a curator at Winterthur.

With Hummel's guidance, Alexander became an expert on antique chairs made by the Dominy family on Long Island, including one interesting chair in the study collection that could be disassembled when the humidity is low (she was permitted by the museum to disassemble the chair, by the way).

All of this led Alexander to experiment with wet wood. To test theory after theory on joinery, moisture content and how wood behaves. Some of the chairs work fine. Some do not.

At some point she decided to write a book about her chairs and traveled to New England in 1977 at the suggestion of fellow craftsman Richard Starr. Alexander says she and Starr visited John Kelsey, the editor of *Fine Woodworking* magazine, at his home with a draft of the manuscript for "Make a Chair from a Tree" (Alexander says she "just happened to have the draft in hand").

"Kelsey read the draft overnight and hired me in the morning," Alexander says. "Kelsey also hired Bruce Hoadley to read the text. Hoadley advised Kelsey, and I listened to every word."

'Make a Chair From a Tree'

"Make a Chair from a Tree" was the first woodworking book published by Taunton Press, Alexander says. At the time, the new magazine was just getting started working on books with Tage Frid and Bruce Hoadley, but Alexander was ready to go, says Kelsey, the then-editor.

"I remember thinking it was a perfect topic for the then-new *Fine Woodworking* audience, the concept was so elemental and fundamental, and so unlike anything then in print; it cut to the very core of what we were trying to do," Kelsey says. "At the same time, the publisher, Paul Roman, had a more conventional view of our woody audience and judged it a risky proposition, perhaps a very hard sell. But we didn't

> "The faster a thing is created, the more fleeting its permanence."
>
> *—Friedensreich Hundertwasser (1928-2000), Austrian artist & architect*

WHAT MAKES A 'JENNIE' CHAIR?

During a 2014 interview with Jennie Alexander, she explained some of the features of her chair that she thought were critical to its strength, comfort and beauty. Here are a few of her comments.

On support:

"What is the lumbar spine about? Slat-chair people want to use seven slats – some slats are above your head. Is the chair beautiful? Oh yes, it's a wooden octopus. But is it comfortable? Some day you are going to find the lumbar spine."

On her chair design in comparison to a ladderback kitchen chair:

"My first one-slat chairs were too heavy with hickory and big parts. I asked: Can we lighten it up? I always thought of the kitchen chair. That is a masterpiece.

"The mule ear of the back legs – curved slats and back posts are a comfort to the spine. It looks good. And it is hard to do. My slats are thin and flexible. I've lost only one of them in 45 years to a split.

On chair construction:

"I interlock the tenons in a way that withstand forward and back movement – the bane of all chairs. I want every rung to share the shock. It's like grass in the wind. They all share the load."

On assembly:

"I assemble the side frames first, which is a pain in the butt. I put chairs together with a long bar clamp. The joint has a slight interference fit of .01". When you assemble it, it sounds like small arms fire – you have an oversized bone-dry tenon going into a slightly moist mortise, and drive it in squawking.

"The sides of the tenon are removed (sometimes a traditional technique) to ensure that the effective bond is between the domes of the tenon's ray plane with the end grain of the mortise. And that's the Alexander chair."

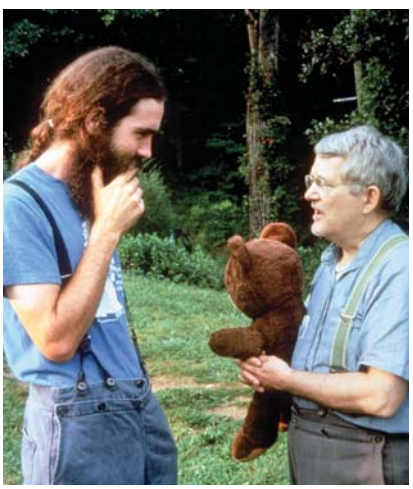
A look inside. *This cutaway sample shows how the tenons interlock in one of Alexander's chairs.*

know, and it wasn't going to be a huge investment of time or money, so we agreed to jump and find out."

Kelsey and Starr traveled to Baltimore to work on the book with Alexander. Roman, the magazine's publisher, shot the photos, Alexander says. The team worked to shape up the manuscript for its 1978 release. (Upon reflecting on the process, Alexander says she was "eternally grateful" for Starr's help in particular.)

Meanwhile, Alexander continued to investigate chair technology and offered huge changes right up until the moment the book went to press – an unconventional way to make a book (or a chair for that matter).

One of the biggest last-minute changes was in how the parts were shaped. Alexander had been using a lathe to turn the components. But right before an EAIA meeting, Alexander was told she couldn't use a lathe because it was too dangerous to the audience if something flew loose.



In the country. *Peter Follansbee, Theodore and Jennie during their early days at Country Workshops.*

"I was down in the shop kicking stuff. I didn't know what to do," Alexander says. "Joyce gives me a cup of tea. She says, 'You shave stuff eight-sided to put it on the lathe don't you? Well keep going.'" Alexander went to the meeting and returned with a shaved chair.

Chair in use. *While Peter Follansbee was the joiner at Plimoth, he would use this chair made by Alexander to explain some aspects of joinery and chair technology.*

Alexander switched to shaving the chairs instead of turning them. Kelsey then had to re-write the book, Alexander says.

"But we wanted a great little gem of a book, and we didn't want to be issuing revised editions within a year or two, so we rode the pony right to the ground," Kelsey says.

"Make a Chair from a Tree" hit the market in 1978 with multiple advertisements in the magazine that were supported by articles from Drew Langsner and Alexander on green-wood techniques and technology. Kelsey says the book – 128 pages in an unusual 9" x 9" format – was a hard sell with most readers. But it was aimed right between the eyes of Peter Follansbee in Massachusetts.

"I was in my shop with a table saw and a drill press," Follansbee says. "I think I was trying to make a bookcase. With those two articles I was just captured."

Follansbee bought the book, started making chairs and in 1980 saw that Alexander was teaching a class at Country Workshops in North Carolina. Though Follansbee didn't drive a car, he found a way to the school via an airplane, two buses and 25 miles of hitchhiking and walking. In time he became a regular at the school, and he and Alexander became friends through a love for green woodworking and a twisted sense of humor.

At the time, Alexander was exploring theories of how case pieces had been made using 17th-century green-woodworking techniques such as riving stock, and joinery techniques including drawboring that Benno Foreman, Robert Trent and Hummel at Winterthur were also researching. They helped open the door for Alexander's research in giving her access to old pieces.

Early on. *Alexander at Country Workshops in 1979 with Geli Courpas, her first apprentice.*

"He (Alexander) was looking for someone to test his theories," Follansbee says. "He was practicing law and didn't have time to build a complex piece. So I ended up saying, 'I'll go fart around with some of this.' I had given up all my power tools. I had found a good-sized log. He (drew out) the joint on the junk mail on his table. I rose to the bait."

That moment launched a long correspondence between Alexander and Follansbee, who would swap letters and photographs from their homes in Baltimore and Massachusetts. And eventually the letters led to the book "Make a Joint Stool from a Tree," which explored 17th-century joinery and stock preparation.

This dunking into the world of green woodworking led Follansbee to become the joiner at Plimoth Plantation for more than 20 years, where he continued to explore 17th-century furniture.

"All in all, (Alexander) has been a huge part of my life," Follansbee says.

Country Workshops

Follansbee was similar to many woodworkers who discovered green woodworking through "Make a Chair from a Tree." He started with the book and ended up studying it deeply under the direct tutelage of Alexander at Country Workshops in rural North Carolina.

Drew and Louise Langsner founded Country Workshops in 1978 shortly after the couple had written a book titled "Handmade," and Drew had just finished a book called "Country Woodcraft."

DREW LANGSNER ON POST-&-RUNG CHAIRS

When I first learned to make post-and-rung chairs I was thinking that structurally they lacked triangulation, but that (adding triangulating structures) would be very challenging with the post-and-rung construction.

It wasn't until I dug down into trying to understand Japanese timber framing that I realized that the lack of triangles ("braces" in conventional American and British timber-frames) is what makes the post-and-rung chair so sturdy. Particularly in Jennie Alexander's very light version. Under impact and load, the (chair's) frame springs around; this disperses the load over a wide area.

With triangulation, the frame is stiff and loads tend to accumulate at the triangle apexes; they can come loose. The Japanese house frame without braces flexes during their many earthquakes. The roof geometry is a big triangle, but there's no joinery up there. All the poles are lashed together and therefore wiggly when the frame below moves.

But Alexander and John Kelsey were able to show that the major stress/failure on a chair has little to do with load. It's almost all the result of countless fluctuations in moisture content within the joint.

— Drew Langsner, Country Workshops, countryworkshops.org

Ready for comfort. *The back legs of Alexander's chairs are shaved to shape, steam-bent and then placed in these forms to dry, ensuring they hold their shape.*

COUNTRY WORKSHOPS PHOTO BY DREW LANGSNER.

"Almost as soon as that book comes out I get a letter from John who was very excited about the book," Drew says. The two resolved to meet when Drew traveled to New England to speak at the Woodcraft Supply store.

During the visit, Drew invited Alexander to Country Workshops to teach a class on building a simple stool. That class soon evolved into a class on building a simple chair with one slat and finally the chair that appeared on the cover of "Make a Chair from a Tree."

And Country Workshops became the flash point for woodworkers who wanted to explore traditional woodworking in a deep way that was rooted both in tradition and science.

Even today, people come from all over the world to study chairmaking at Country Workshops, many of them inspired by Alexander's incredibly lightweight chair.

"In fact, some students (from Australia) were here last week were sent here by Jennie," Louise says. "She is always encouraging people. I think that is a special thing about her – generosity.

"Woodworking is such a special part of her life and she wants to share."

So what is it about Alexander's chair that still continues to inspire people to build it? Drew says it's interesting to him because Alexander's chair is essentially a historical ladderback design that appears over and over.

Sitting pretty. *Alexander's chair (foreground) with a simple antique ladderback behind. You can see both the similarities in form but the vast differences in style.*

But Alexander was not content to just build a reproduction and call it done. Alexander, a jazz singer, likes to explore variations on a theme.

"The Appalachian chairs were a little clunky," Drew says. "John's are really slender and elegant. How he came up with that look I don't know. But the look changed everything.

"He refined the chair just perfectly."

In fact, Drew says he's about to start making a set of them for their house and daughter. And they were going to be exactly the same chair shown on the cover of "Make a Chair from a Tree."

"It's like Alexander took an old piece of music," Drew says. "She's following all the 300-year-old notes and making it new again." **PWM**

Still shaving. *Alexander's Baltimore shop is light and airy, despite its location in a densely populated urban area. Green woodworking doesn't have to happen in the country.*

Chris is the editor at Lost Art Press and is working with Alexander to produce a new revised edition of "Make a Chair from a Tree."

ONLINE EXTRAS

For links to all online extras, go to:

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WEB SITE: *Visit Jennie Alexander's site.*

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Work Begun

Forget the stockpile of wood; what about the stock of partial projects?

When building furniture, some woodworkers keep a stockpile of lumber on hand and draw from their stacks as they begin a new project. Others buy enough lumber (with some extra) for each piece they are planning to build, often working from a list that includes all the pieces in a given project and their rough dimensions. I work in a different way. I start with a log and split out almost every piece of oak that I use at the bench. Starting with the log is a lot of work, but it's even more fun.

When I split open a log, I have an idea of what my needs are, but the log often has ideas of its own. If I have a particularly large diameter, straight-grained example, then I split out and stockpile wide panels for joined work, even if I have no immediate need for panels. This approach usually results in my starting several projects at once, then leapfrogging back and forth between them.

Sometimes there are quite a few pieces underway, usually limited by shop space. When I was preparing to move my shop a year ago, I had a joined chest, a chest with drawers, a chest of drawers, two wainscot chairs, a long table and several joint stools. I finished a carved box in the midst of all these.

In progress. *My shop is no different than those of period joiners (and likely no different than yours), with multiple works in various stages at any given time.*

Most of those I finished up so I didn't have to move them. Some got stalled (the chest with drawers and the chest of drawers). I've just been back in a shop for two months and have revived those two pieces and made a large box with a drawer. Then the floodgates opened.

I now have underway the two chests, a carved box, two more wainscot chairs, a joined stool and the beginnings of two joined carved chests.

In one corner. *This heap includes a chest with two drawers, a box front, an-almost done box with an interior till, parts for a wainscot chair, a piece or two of a chest of drawers and red oak framing stock ready to be "appointed" to any or all of these projects.*

I'm not alone in this of course. I take solace that period joiners were as scattered as I am. Or more so.

In the 'Shopp'

Take the 1596 inventory of Philip Joslyn, filed in Exeter, England. The appraisers, Nicholas Baggett and Martin Garrett (alias Harman), were both joiners themselves, so we get great details:

"Item one Presse beinge half made 20*s*; Item certaine timber beinge appointed owt for a Table 6*s*8*d*; Item endes of timber and endes of Bourdes in the same shoppe 13*s*4*d*; Item certen Seelinge in the same shopp beinge made 8*s*; Item half a hundred of Montens & half a hundred of stooles legges 4*s*."

The "Presse" is a large cupboard for clothing. These usually have doors instead of drawers, often with pegs inside for hanging clothing.

"Certen Seelinge" today would be spelled "certain ceiling," but it doesn't

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PHOTOS BY THE AUTHOR

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Wainscot. *The hall in the Merchant's House (Marlborough, Wiltshire) shows period wainscotting; a room or two like this could easily use "half a hundred" muntins. The inset photo (below) shows a cross-section of a wainscot muntin (notice the drawbore holes).*

mean the part of a room over your head. It refers to wainscotting or paneling on hand, presumably already dedicated to a particular room, hence "certain." Joiners in the 16th and 17th centuries were often called by the double moniker "joiner and ceiler."

The 50 "Montens" are muntins – the short intermediate framing parts, perhaps for more of the wainscotting.

The stools' legs are the squared sections for joint stools, maybe already mortised and turned.

Also, the quantities can throw you. "Half a hundred " could be 60 pieces. In many cases a "hundred" is six-score, i.e. 120 pieces.

In 1613, Anthony Ould, of Worcester, England, had half-finished work and timber on hand when he died. Listed in his inventory were:

"In both the shopes: two standing bedes finesht £2-6, on(e) liverye bed steed 5*s*, two bed steeds begune 6*s*, on(e) presse begune 13*s*4*d*, two payer of pyllars and other worke 19*s*, panels £2-16-7, rayles £4-11-4, 2 inche planckes of wallnut tree £2, halfe inch bordes of wallnut tree 6*s*8*d*, inch and quarter of wallnut tree 15*s*, two oaken plankes 4*s*9*d*, certayne other peces of tymber £4, turned and carved worke 12*s*8*d*, more odd tymber 6*s*."

That's a lot of bedsteads underway at once; he must have had a fair amount of room available. A press is also substantial. The pillars could be large turned work for the bedsteads, but also could be turned parts for cupboards. Like the previous inventory, this one includes stock processed into framing parts, this time rails and panels. The price comparison between the rails (£4/11/4) and the finished bedsteads (£2/6) tells us there's a lot of rail stocked prepped ahead in this shop.

Over in New England, the trend continued. In 1671, John Symonds, of Salem, Mass., had "2 Bedsteds almost finished £3" and "3 stools and one half of a Box 12*s*6*d*; Timber planke & board £5-12." His inventory also included "part of a Chest…Timber in the Woods £1-2, an apprentice of 17 years old who hath 3 year and 9 moneths and 2 weekes to serve."

For me, it's more fun starting projects than finishing them. Ultimately, I get to the point where I'll settle down and finish off pieces in rapid-fire succession. For a brief time, it really looks like I know what I'm doing. But were an inventory of my "shopp" to land in front of a curious craftsman 400 years from now, pretty much the only thing that would distinguish it from Joslyn's or Ould's lists would be the currency, and the spelling of "presse" and "wallnut." **PWM**

In progress. *One piece "begun" is this chest of drawers. This is the upper case, still lacking some applied ornament and the top boards.*

Chest build. *Here's a joined chest – or three-quarters of one, at least. Finish the rear framing, a lid and bottom, and off it goes.*

Peter has been involved in traditional craft since 1980. Read more from him on spoon carving, period tools and more at pfollansbee.wordpress.com.

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BLOG: *Read Peter Follansbee's blog.*

TO BUY: *"17th Century New England Carving: Carving the S-Scroll" (Lie-Nielsen).*

IN OUR STORE: *"The Arts & Mysteries of Hand Tools" on CD.*

About this Column

"Arts & Mysteries" refers to the contract between an apprentice and master – the 18th-century master was contractually obligated to teach apprentices trade secrets of a given craft (and the apprentice was expected to preserve those "mysteries").

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Why is Finishing So Difficult?

Misleading claims and directions may be due to manufacturer ignorance.

In the previous issue (#216) I wrote about teak oils and how none have anything to do with teak wood. Reading the article, you may have asked yourself why companies would put out products that aren't what they say they are and don't do what they say they do.

I used to think the people at these companies knew better and did this to fool us. But after more than 25 years of dealing with them, I've come to believe that many who target the DIY market just don't understand their products. The companies aren't actually finish companies; they're marketing companies. They just sell stuff, using whatever labeling or claims they think will work.

How can they do this and get away with it, you ask? In my opinion it's because finishes are chemistry – in contrast to woodworking, for example, which is physics. You can see that a band saw isn't a table saw, even though it, too, has a table. But you can't see the difference between varnish and lacquer, either in the can or on the wood – and they are very different finishes.

Because many marketing people have little understanding (even though their products are usually very good), we, the users, struggle. How else can you explain the following examples?

Watco Danish Oil

Watco Danish Oil was introduced to the woodworking community in the second issue of *Fine Woodworking* in 1976. The application directions in the article were good, and they have been repeated by writers and teachers countless times since: Apply a wet coat; let it soak in; wipe off; let dry overnight; sand smooth; apply a second coat, and maybe a third after another day.

But the directions on the Watco can were (and still are): Apply a wet coat; wait 30 minutes; reapply; wipe dry after 15 minutes. This doesn't produce good results because it's really just one coat. The first hasn't dried before the second is applied. The full sheen and smoothness of any finish isn't produced until a second coat is applied over a dry and sanded first coat.

But in nearly 40 years, as Watco was bought and sold by many companies, (It's now owned by Rust-Oleum), these directions never changed.

Watco Danish Oil. *The application method Watco suggests on its label is a two-step single coat, both steps applied within 45 minutes. This results in a slightly duller and clearly rougher feeling surface (left half of surface) than the better application method (right half of panel) suggested by experienced woodworkers for nearly 40 years.*

Minwax Wood Conditioner. *The company says to apply the stain within two hours of applying the conditioner. Shown on this panel, left to right, is the stain applied directly to the wood; immediately after applying the conditioner; after 10 minutes; after two hours, and finally after overnight drying. Notice that the blotching actually gets worse (because of the evaporation of the thinner) the longer the elapsed time until the thinned-varnish conditioner has fully dried.*

Minwax Wood Finish & Wood Conditioner

Minwax has also been bought and sold many times, most recently bought by Sherwin-Williams. But the name, "Wood Finish," on their yellow cans of stain has never been changed to reflect what the product really is – a stain. Though experienced woodworkers know this, the mislabeling causes confusion for beginners.

Minwax also makes "Wood Conditioner" and provides instructions on the can for avoiding blotching. Apply a wet coat; wipe dry after five to 15 minutes; apply the stain within two hours.

These directions don't work well. The wood conditioner is varnish thinned with about two parts mineral spirits. It requires six hours to overnight to dry and become effective at reducing blotching.

3M Safest Stripper

3M Safest Stripper was introduced in the early 1990s as a substitute for strippers based on methylene chloride, which was a suspected carcinogen. The stripper is almost unique in that it contains 65 percent water.

Apparently no one at 3M understood

PHOTOS BY THE AUTHOR

the relationship between water, wood and paint stripping.

Safest Stripper works very slowly, so it has to be left in contact for a long time. This can cause veneer to lift, especially on old furniture (pre-1950) glued with animal hide glue, and it causes steel wool to rust and leave black marks on the wood. The formulators had apparently been using 3M's own Scotch-Brite pads, and no one had enough experience with stripping to realize that most people use steel wool.

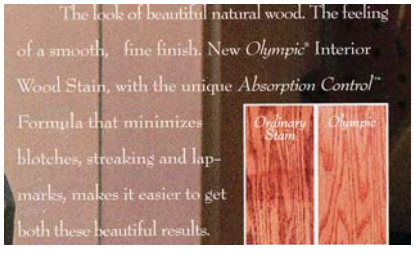
Olympic Stain

Olympic Stain had been the best-known deck stain for decades. When PPG bought it in the mid-1990s, they did a survey and found that Olympic was the second best-known interior stain behind Minwax, even though Olympic didn't make interior stains.

Being good marketers, they quickly introduced a line of interior products modeled after Minwax, and they advertised for months in woodworking magazines with one- and two-page advertising spreads.

Highlighted in the ads were two pictures of oak, one blotched with an "ordinary" stain, the other an even color with their "absorption-control" stain. The problem is that oak doesn't blotch! Apparently, no one at Olympic knew this. Pine and cherry blotch, and Olympic stain blotches them just as all liquid stains do.

3M Safest Stripper. *Because of the high percentage of water in this paint and varnish remover, steel wool used for scrubbing off the sludge rusts and causes black marks on the wood. This caught the manufacturer by surprise. To fix the problem, 3M put this warning sticker on the cap.*



Olympic Stain. *This is a part of the ad Olympic Stain ran in woodworking magazines to introduce their interior stain. The oak on the left is blotched, but oak doesn't blotch. The only ways I can think of to get oak to look like this are to do a poor job of sanding or generate the image on a computer.*

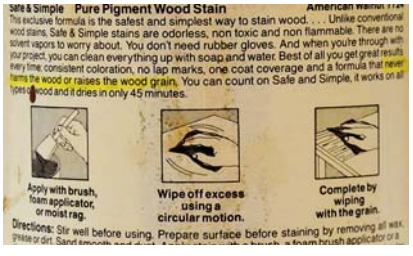
Carver Tripp Safe & Simple

Carver Tripp was once a prominent finish company sponsoring Norm Abram. The company made a water-based wood stain called Safe & Simple. One big issue with water-based stains was, and still is, that they raise the grain of the wood. So Carver Tripp dealt with this problem by simply claiming on the label that their stain "never harms the wood or raises the wood grain."

Did no one at Carver Tripp know enough about water and wood to realize that making such an obviously false claim might not be a wise thing to do? Carver Tripp no longer exists.

General Finishes Seal-a-Cell

When I was writing "Understanding Wood Finishing" in 1993, I called General Finishes to ask about Seal-a-Cell,



Carver Tripp water-based stain. *To deal with the problem of water-based stains raising the grain of the wood, the marketers at Carver Tripp simply said theirs didn't. Did no one try the stain or realize how obviously false this claim is and that making it might damage the reputation of the company?*

Seal-a-Cell wiping varnish. *The way to tell if a finish that thins and cleans up with mineral spirits is oil or varnish is to put a puddle on a non-porous surface. If the puddle dries soft and wrinkled, it's oil or oil/varnish blend. If the puddle dries hard and smooth, it's varnish. This is clearly varnish despite the claims of the manufacturer.*

which was, and still is, represented as an oil sealer that "penetrates deep within the wood." But a puddle dries hard and smooth, so it had to be varnish. (Varnish is made with oil, but it's no longer oil and the oil part can't act separately.)

To prove that the finish was oil, the owner told me the main ingredient: alkyd-modified linseed oil. This, of course, is a more technical name for varnish! He didn't know.

I think it's manufacturer ignorance that is most responsible for making finishing so difficult to understand. This explains why the help you get when you call these companies is so poor.

The products are good; the instructions and claims are not. **PWM**

Bob is author of "Flexner on Finishing," "Wood Finishing 101" and "Understanding Wood Finishing."

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Why I Love Ikea

Lessons from a big box guide my approach to woodworking.

I love Ikea. Yes, I said it.

This store has provided me with an understanding of furniture design and with products I use on many of my projects. For some I'm happy to pay, but for most I haven't had to pay a penny.

I first became aware of furniture design while walking our dog. Seriously. To get to the off-leash park, we walked down back lanes.

I was alarmed at the sheer quantity of discarded furniture – Ikea furniture, to be precise. I began to examine this stuff more closely, and gradually a pattern emerged.

From this pattern I formed a "law" of furniture design. Take, for example, Ikea beds: Pieces broke right where the mechanical fasteners were placed. Well, it figured, two kids jumping on a bed = dynamic load. Therefore, dynamic load + barficle-board + mechanical fasteners + time = garbage.

I learned about chair construction – actually how not to construct a chair – while working at Chez Phillipe, a cozy French bistro. Maybe it was serendipity that caused me to observe how Ikea chairs failed, but I made the necessary observations seated on the "throne."

When a chair failed, the waiters hauled it off to our tiny staff washroom. At any given time, there were five failed chairs crammed into that tiny john.

The owner would salvage what he could from broken chairs and reassemble a single one. Missing chairs were replaced with the same Ikea model and given a coat of lime-green paint (to match the decor of Chez Phillipe).

There were three major causes of failure: First was choice of materials; the chairs were softwood, pine I think. Again, wood around the mechanical fasteners failed, or wood was compressed and then racked, and fasteners would fall out.

Second is that dowels make lousy joinery for dynamic loads; they invariably failed.

Third is poor stock selection. The curved rear legs almost always failed because of grain runout. After a year working there, I had opportunity to examine how nearly 80 identical chairs failed, and it never cost me a dime. Not an armchair detective, but close.

As I became more proficient with tools and had time to make projects, I began to see discarded furniture in the back lanes in a different light – as a resource. I haven't bought cup hinges in 10 years now – same with drawer glides, knobs, and pulls.

Ah, but wood, you ask, can real wood be salvaged from Ikea castoffs? Yes, there is some real wood in Ikea furniture.

Discarded beds come with solid spruce bed slats, which are just under 3/4" thick, 34" long, and about 3" wide. I have built numerous projects with these.

Hardwood? Yes. To build my bow saw, I bought the hardware, like many others do, from Tools For Working Wood. But the beech for my saw came from Ikea. Actually, it came from my neighbor when he tossed out his Ikea Poäng armchair. There was even enough left over to make an English layout square.

So when do I actually make a trip to the big blue and yellow box and fork out money? I do it for one, and only one item: Numerär. That's the 1 1/2"-thick countertop in solid beech or birch. It's not furniture; it's building material.

As a result, I'm grateful for Ikea. Just not for the reasons Ikea wants me to be. **PWM**

While Edward has splurged for "real" lumber in some projects, others are made from furniture he finds while walking his dog in Vancouver, British Columbia.

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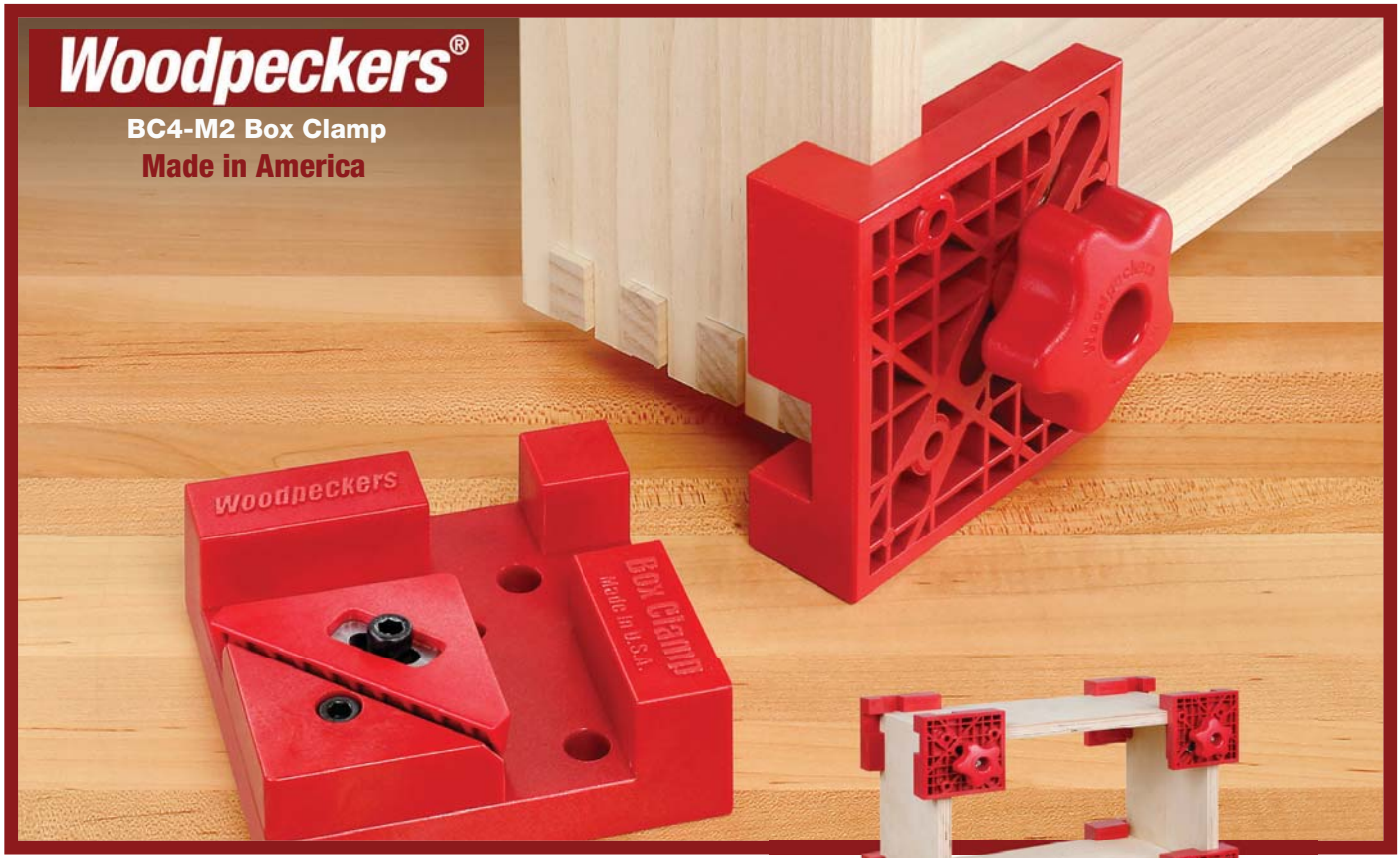

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